The New England
Journal of Medicine

VOLUME 214 JANUARY 30, 1936 NUMBER 5

NEW ENGLAND SURGICAL SOCIETY

CONGENITAL ABSENCE OF THE PERICARDIUM*
With Report of a Case

BY WILLIAM E. LADD, M.D.†

ABSENCE or deficiency of the pericardium is one of the rarer of the congenital malformations. The condition was first accurately described by Baillie[1] in 1788 though it had been mentioned by Realdus Columbus as early as 1559. Since that time reports of individual cases have been made in the literature occasionally. By 1925 Moore[2] was able to collect sixty-four cases and by 1931 Beck[3] was able to collect sixty-seven cases including one reported by himself. In this series there are several in which other congenital anomalies were found but only three which were associated with diaphragmatic hernia. These three cases were reported by Risel (see Moore). Two of the cases were found in the fetus and the third in an infant who died immediately after birth.

In one fetus the hernia was a true diaphragmatic hernia on the left side with displacement of the thoracic and abdominal organs. In the other fetus and infant dying at birth the hernia was a false one with displacement of the abdominal and thoracic organs. In all these three instances there were numerous other associated anomalies quite incompatible with life. It is surprising that these two malformations have not been found together more commonly when one considers the very intimate developmental connection between the pericardial, pleural, and peritoneal cavities. All the cases of pericardial deficiency in the literature have been autopsy reports. The condition is apparently not incompatible with an active life, nor does it have an effect on longevity. In no instance was it considered to be responsible for the death of the patient. The case here to be reported is, so far as I know, the only case in which the condition has been recognized during life. In this instance it was not diagnosed but was a chance finding in the course of an operation for the repair of a diaphragmatic hernia.

The patient, a female child two years of age, was referred by Dr. Walter L. Sargent of Quincy for the treatment of diaphragmatic hernia.

F.H.: The mother is twenty-nine years old, the father thirty-three years old and both are living and well. There are four other children all living and well. There were two pregnancies antedating the living children which terminated at six months. One premature baby lived one hour only and the other twelve hours. There is no family history of lues and there is no other relevant factor in the family history.

P.H.: The patient was born at full term and by a normal delivery. The birth weight was 7 lbs., 14 oz. When feeding was attempted the baby became cyanotic, choked and regurgitated. This difficulty appeared to be more marked with breast than artificial feeding. She was therefore removed from the breast and fed on a lactogen formula. At this time diaphragmatic hernia was suspected and confirmed by x-ray studies. For several weeks the baby continued to have cyanotic attacks when fed and remained on the danger list at the Quincy Hospital. At the end of three months sufficient improvement had taken place for the patient to be discharged from that hospital. From that time until she was two years old and entered the Children's Hospital she had weathered an attack of measles, German measles, and chickenpox, but had failed to gain weight satisfactorily. At two years of age she weighed 18 lbs. which is slightly under the normal weight for an infant of one year.

P.E.: Examination showed an undernourished small girl of good color.
Chest: Percussion over the left chest posteriorly revealed dullness below the 3rd rib and from the mid-line to the posterior axillary line. Anteriorly the percussion note was tympanitic. Breath sounds on the left were distant and only vaguely heard. Percussion of the right chest was hyperresonant but the breath sounds were normal and no râles were heard.
Heart: The borders of the heart were difficult to define by percussion. The apex impulse could not be felt. The heart sounds were distant without murmurs, of normal rhythm, and rate of 100.
Abdomen: This was flat or perhaps a little scaphoid in appearance. The liver edge was 1½ cm. below the costal border in the nipple line. The spleen was not palpable. No tenderness, muscular spasm, or palpable masses were felt.

Laboratory Data:
Urine normal.
Blood 70 per cent Hgb. 4,150,000 R.B.C. 8,700 W.B.C. Normal smear. Type IV. Mother type IV compatible. Tuberculin test negative.

X-Ray: Fluoroscopic examination showed the esophagus displaced slightly to the right. The

*Read at the Annual Meeting of the New England Surgical Society, at Manchester, N. H., September 28, 1935.

†Ladd, William E.—Chief of Surgical Service, Children's Hospital, Boston. For record and address of author see "This Week's Issue," page 217.

barium entered the stomach without difficulty. The whole of the stomach was in the thoracic cavity, inverted, and with the greater curvature against the chest wall lying superiorly while the pylorus was lying inferiorly. At six hours after the administration of the barium it was all in the colon. The cecum and ascending colon were in the left side of the chest with the appendix visualized just lateral to the heart. There was apparently a portion of the left side of the diaphragm present anteriorly and a portion posteriorly.

Interpretation: Left-sided diaphragmatic hernia.

FIG. 1. Preoperative anteroposterior x-ray of stomach in thorax.

Preliminary Operation:

Under avertin and novocain anesthesia a small transverse incision was made in the left side of the neck an inch above the clavicle. The outer border of the sternomastoid was retracted toward the midline and the phrenic nerve exposed on the scalenus anticus muscle. The nerve was crushed with a small hemostat and the wound closed with interrupted silk sutures to the fascia, platysma muscle and a subcuticular silkworm gut suture to the skin.

Second Operation:

Four days after the preliminary operation the abdomen was opened under avertin ether anesthesia. A left rectus incision was made extending from the costal border to a point about an inch below the umbilicus. The peritoneum was incised and the peritoneal cavity and diaphragm inspected. There was an opening about three inches by two in the left side of the diaphragm extending from the nipple line toward but not connecting with the esophageal opening. Above the opening in the diaphragm in the thoracic cavity was found the whole of the stomach, the spleen, the splenic flexure, half the transverse colon and about four or five inches of the descending colon. These organs were very easily delivered from the thoracic cavity there being only a few light adhesions around the cardiac end of the stomach. The abdominal viscera presented the not very uncommon condition of an unrotated colon with a rudimentary mesenteric attachment. There was no oblique attachment to the posterior abdominal wall of the mesentery of the small bowel and only a small area of attachment of the hepatic flexure of the colon. The cecum and ascending colon were lying loose in the epigastrium just under the hernial opening. An incision was made around the edge of the hernial opening through both the peritoneal and pleural layers. As soon as the pleura was opened and air entered the thoracic cavity the sac was delivered with no difficulty and completely excised. On looking through the opening in the diaphragm the lung was seen collapsed and the heart next to it

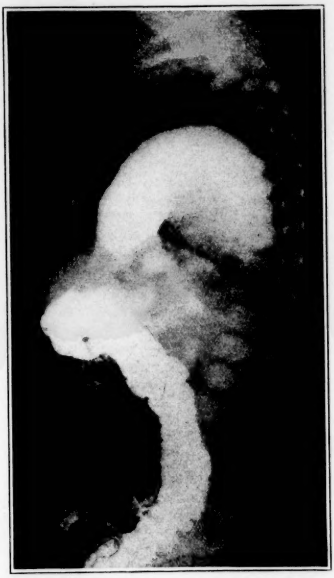

FIG. 2. Preoperative lateral x-ray of stomach in thorax.

in the same cavity without any pericardial covering. The ventricles stood out plainly to their base. I could not see the auricles and do not feel sure there was not a rudimentary pericardium as found in some of the autopsy reports. The hernial opening in the diaphragm was closed with one row of interrupted sutures of silk to the pleural layer, one row of mattress sutures of silk to the musculature of the diaphragm, and another row of interrupted silk sutures to the peritoneal layer of the sac. The abdomen was closed in layers without drainage.

Pathologic Report:

GROSS DESCRIPTION: The specimen consists of a thin-walled sac measuring approximately 10 cm. in diameter. The wall of this sac is composed of two layers of thin membranes which are entirely separated from each other except along one side for a distance of approximately 4 cm. In this region the membranes are fused and between them is a thin layer of muscle fibres. Both surfaces of each membrane are clear, grayish in color, smooth, moist, glistening, free from exudate and inflammation. Several petechial hemorrhages are noted in both

FIG. 3. Preoperative lateral x-ray of colon in thorax.

layers. Sections are fixed in Zenker's. The rest of the specimen is preserved in formalin.

MICROSCOPIC: Six sections. Both surfaces of the sections are covered by very dense connective tissue. There is no inflammatory reaction. The mesothelial cells are seldom seen and in the few areas in which they are preserved marked fragmentation is seen. The central portions of the tissue are composed in part of bands of collagen fibers which run roughly parallel to one another and are very closely packed together. Striated muscle is almost entirely lacking. Among the collagen fibers are numerous duct-like structures. These are lined by cuboidal epithelium. They present lumina of various sizes but the lumina are mostly small. All of them are empty. They are not surrounded by a definite connective tissue wall and there is no inflammatory cellular infiltration in that region. The interpretation of the histogenesis of these structures is difficult. Dr. Wolbach suggested that they might be small portions of mesenchymal tissue with early formation of a cavity in the manner in which the pericardial and other serous cavities are formed in the embryo. There are no definite masses of cells, however. In addition, bundles of smooth muscle are found from place to place.

DIAGNOSIS: Diaphragmatic hernial sac.

SIDNEY FARBER, M.D., *Pathologist.*

Convalescence:

The first twenty-four hours after operation were somewhat stormy. The temperature rose to 104°F., the pulse to 160, and the respirations to 60 to the minute. The systolic blood pressure was 70 and the diastolic 20. At the end of another 24 hours the temperature had dropped to 101°, the pulse to 130 and the respirations to 25. The blood pressure was 96/58. During this period there was an almost complete left-sided pneumothorax with an almost complete collapse of the left lung. A 90 per cent collapse of the left lung was estimated by the roentgenologist at this time but without displacement of the heart. From this time on, the convalescence progressed satisfactorily and uninterruptedly. The patient was kept in the hospital a longer

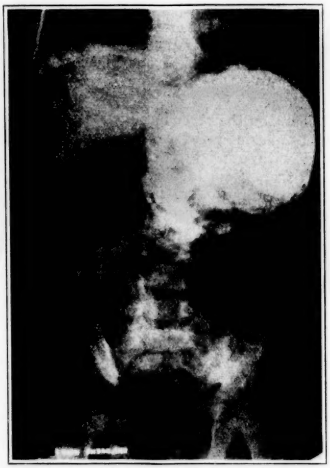

FIG. 4. X-ray four months postoperative.

time than usual to make sure that there were no circulatory disturbances and until the lung was entirely expanded. She was discharged on the 26th day after operation. The wound was healed per primam with a firm scar. The abdominal organs were in the abdominal cavity. The lung was completely expanded and there was no air or fluid in the pleural cavity. The x-ray report at this time stated that the heart was slightly displaced to the left, but there was no other abnormality. The child's general condition was excellent. Follow-up examination was made September 23, 1935, four months after the operation. The child has gained four pounds in weight, has had a good appetite, and the bowels have moved normally. The systolic blood pres-

sure was 86 and the diastolic 50. The x-ray examination showed the left diaphragm in the normal position and moving with respiration. It also showed the stomach and abdominal viscera in their normal position.

It is interesting to speculate as to whether the somewhat stormy convalescence of this child for the first forty-eight hours after operation had any relation to the absence of the pericardium. There are no clinical data on this particular situation and for the nearest analogous conditions one must turn to experimental work and to human beings who for one reason or another have had the pericardium opened.

Beck and Cox[1] did some experimental work to determine what effects on the mechanics of the circulation were produced by exposure of the heart to atmospheric pressure. They concluded from their experiments that when the heart was exposed to atmospheric pressure the minute output of the heart fell about twenty per cent. They considered the changes produced as a pressure phenomenon and applied the term of pneumocardiac tamponade for this mechanism. They suggest that atmospheric pressure on the heart might be a factor in producing cardiac failure.

Blalock[5], on the other hand, exposing the heart to atmospheric pressure in experiments performed with a slightly different technic, concluded that, "No definite alterations in the arterial pressures were noted and the changes in the output of the heart were not marked."

Amerio[6] concluded from experimental work on rabbits that total resection of the pericardium did not affect the life of the animal. These conclusions of course tally with certain clinical data and with the histories of patients with the condition that is the subject of this paper and, for what it is worth, with the progress of this reported case so far. The patients who have had the pericardium opened for pericarditis or other reasons do not, so far as I know, suffer from the heart being exposed to atmospheric pressure.

COMMENT

A case of congenital deficiency of the pericardium is here reported increasing the number to be found in the literature to sixty-eight. It is believed that this is the only case of this condition to be recognized during life. From the literature one may conclude that the condition is compatible with an active life of normal duration.

The question of the effect of atmospheric pressure on the heart is debatable and depending on this, one should consider the desirability of taking steps to reduce the pneumothorax which follows this type of operation. In this instance the air was allowed to absorb gradually and the outcome was fortunate.

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DISCUSSION

DR. THOMAS H. LANMAN, Boston, Mass.: This case of multiple anomalies just presented brings up the question of how often these developmental defects are multiple. I think the teaching, as I remember it, was that they very frequently are. However, in a series of 592 cases of congenital anomalies only eighty-two, or 13 per cent, showed more than one anomaly. But in these 592 cases there is a series of 167 that had anomalies of gastrointestinal tract and in this 167, seventy, or 41 per cent, showed more than one anomaly.

I think it is fair to say then that in discussing multiple anomalies, they are very likely to be present in cases that involve the development of the gastrointestinal tract, as was the case here.

In the treatment of a case of this sort, there are three things that we have found of value. In the first place, the preliminary crushing of the phrenic nerve has seemed to us to be of very distinct value in diaphragmatic hernia and lobectomy. It is easily done. Even in infants it can be done under avertin and novocain.

The abdominal approach for the repair of diaphragmatic hernia, we believe, is best in these children where it is very likely to be a true hernia with a true sac. In the first place, it seems advisable whenever possible to do as little as we can in having a wide open wound of the thorax. If you are unable to reduce the hernia you can always make an additional incision exposing the thoracic cavity.

As regards the reëxpansion of the lung, and that brings in the question of anesthesia, we feel quite confident that in a case of this sort and in the few cases where we have done lobectomies, that the complicated intratracheal anesthesia is not needed to give us reëxpansion or control over the expansion of the lobe of the lung. As was true in this case, the lung came out very readily. While we do have suction apparatus to get rid of the secretion which, of course, is important in some of these cases, we do not feel that it is necessary to complicate the anesthesia with its added danger of using the intratracheal tube.

I think in this case, the absence of the pericardium probably did not have anything to do with the somewhat stormy convalescence this youngster showed the first twenty-four or forty-eight hours. Certainly, after any lobectomy or operation that involves manipulation around the thorax, they are very apt to have a stormy time.

Also, against opening wide the thorax, is the fact that we like to minimize in so far as we can, the accumulation of serum in the chest cavity, and it seems to us the abdominal approach does minimize that better than a wide thoracic approach.

PRESIDENT JOHNSON: Dr. Parker!

DR. DAVID W. PARKER, Manchester, N. H.: I appreciate the courtesy of being asked to discuss this paper. I must confess, however, that I have had no personal experience with the condition.

Upon consulting the literature, I found three articles, one by Richard L. Moore of Boston, in the Archives of Surgery, November, 1925; one by James C. Watt, Professor of Anatomy at the University of Toronto, in the Archives of Surgery, December, 1931, and another by C. S. Beck, Archives of Surgery, February, 1931. All of these articles were highly technical, and dealt to a great extent with the embryology of this anomaly. Watt, in his article, however, did state that in three hundred and seventy-one years, only sixty-six cases had been reported in the literature. He also stated that the diagnosis of this condition had never been made during life, but always from autopsy, and that in none of the cases reported had it been a factor in the cause of death. It occurred not infrequently in men who had done hard work all their lives. I was unable to find in any of the articles which I reviewed that this anomaly was inconsistent with an active life or a factor in dilation or enlargement of the heart. I think, therefore, it is fair to assume that the absence of the pericardium is of more interest as a rare anatomical curiosity than as a clinical entity.

It is very interesting that Dr. Ladd should occupy the unique position of being the only man who has ever made a diagnosis of this condition during life.

DR. JAMES W. SEVER, Boston, Mass.: I should like to ask Dr. Ladd one question, if I may.

What was the cause of the original diagnosis at Quincy Hospital? What led to the diagnosis originally in the baby you saw a few weeks old? What were the indications at that time?

DR. LADD: She had the typical symptoms which almost all these babies with diaphragmatic hernia have, cyanosis, difficulty of feeding and regurgitation. Of course, with the congenital hernia in the left side, which is very much the most common place, some of them have true hernial sacs, some are false hernias, but the result is much the same. The operation for true hernia is rather easier to perform.

The other conditions, of course, which might be confused with this are the esophageal atresia, tracheal esophageal fistulas, and the other forms of esophageal obstruction.

THE QUESTION OF "INFLUENZA" AND ATYPICAL PNEUMONIA*

BY JOHN W. CASS, JR., M.D.†

INTRODUCTION

THERE have been mild "influenza" epidemics throughout Greater Boston during the winter and spring of the past two years. Accompanying these epidemics, there have been an unusual number of atypical pneumonias.

It has been my privilege to see a number of these atypical infections in private practice, on the wards of the Massachusetts General Hospital, and among the nursing staff at the New England Deaconess Hospital. It was very striking to notice the degree of confusion regarding the diagnosis, treatment, and prognosis of these infections. A total of seventy-two cases furnished the material for this discussion. A division into three groups is made to simplify the presentation of the material.

The first group consists of fifty-three cases, each of which it was felt justifiable to call "influenza". In doing this, the criteria laid down by Thomas Francis[1] were used, namely, "sudden onset with constitutional symptoms, chilliness, fever, myalgia, headache, mild respiratory symptoms without coryza, the presence of leucopenia, and a course of two or three days which was followed by considerable asthenia and exhaustion". These patients all recovered and the only points of interest were that six developed mild pansinusitis with symptoms of this complication of from four to seven days' duration. These cases all responded to medical treatment. Two other patients developed acute otitis media, both unilateral, and both requiring paracentesis.

The second group consisted of seventeen cases in which, in addition to the clinical picture of influenza, definite signs of chest involvement were present and the active course of the disease extended over a period of five to sixteen days.

The third group consisted of two cases, both fatal, which developed hemolytic streptococcus empyema.

CLINICAL PICTURE

The physical examinations of the patients in the first group revealed marked prostration, and injection of the conjunctiva and nasopharynx. Similar findings were present in the Group II cases, plus dullness and impaired breath sounds, this being usually at one base, commonly the left, and rarely bilateral. These findings were the usual ones when the patient was first seen. A customary course in the Group II cases was that fine, moist, crepitant râles were next heard over the involved area and these persisted even after the dullness and impaired breathing cleared. Frank bronchial breathing was picked up rarely.

In Group III, the findings were essentially the same with a rapid extension of the physical signs in the chest, the process in one case rapidly extending to the other lung.

In addition to the symptoms considered necessary for diagnosis, all patients complained early of vague abdominal distress with marked distention and anorexia. The outstanding com-

*I wish to acknowledge the general help and advice of Dr. Donald S. King and Dr. Dwight L. Siscoe; also the bacteriological aid of Dr. Morris Leader of the Massachusetts State Department of Health.

†Cass, John W., Jr.—Assistant in Medicine, Massachusetts General Hospital. For record and address of author see "This Week's Issue," page 217.

plaint in addition to prostration was cough, this being harsh, dry, nonproductive, and coming in paroxysms. Paroxysms were particularly frequent during the latter part of the afternoon and during the night. They were also brought on at any time by movement or physical effort on the part of the patient, or marked change in temperature of the room.

The patients with chest involvement were subject to waves of cyanosis which were particularly alarming, in addition to the constant appearance of extreme toxicity.

The two patients with empyema complained of severe pleural type of pain. The temperature was of the septic type and varied only in degree and duration in the different groups. The temperature returned to normal in all cases by lysis. The pulse, characteristically, was not so high as one would expect in all except the fatal cases.

BACTERIOLOGY

The bacteriology was inconsistent and very little was done in the first group, eleven cases having throat cultures, all of which showed the usual mouth organisms plus a predominance of hemolytic streptococci. Good sputum specimens were not obtainable. Sputum of a sort was obtained in seven cases of Group II, and in only three of these seven were pneumococci found of sufficient viability to kill a mouse, two being subgroups of the usual Group IV, namely Groups XXII and XIII. The third was a definite Type II pneumococcus. Sputum of all seven cases on culture yielded predominantly hemolytic streptococci. Blood cultures in all cases of Groups II and III were negative. Likewise, agglutination tests for typhoid and undulant fever were negative. Hemolytic streptococci were found in the urine of five cases from the second group. Hemolytic streptococci were found in the chest fluid of both fatal cases.

BLOOD PICTURE

The blood picture in the first group of cases showed a mild leucopenia of four to six thousand with a polymorphonuclear count of 75-80 per cent. Leucopenia was usually more marked in the second group, being characteristically between 2500 and 4500 white blood cells with a polymorphonuclear count of 80-90 per cent. In this group, the sickest patients had the lowest white blood counts, the most marked being that of 1800 white blood cells. Both fatal cases rapidly developed an extreme leucocytosis of 70,000 to 90,000 white blood cells with a polymorphonuclear count of 93-96 per cent.

X-RAY EXAMINATION

Chest films were taken in twenty of the first group, and all were negative. Fourteen of the second group were x-rayed and all showed areas of increased density conforming to the physical signs. One of the fatal cases was x-rayed and the findings were interpreted as diffuse consolidation with no evidence of fluid. Streptococcus pus, however, was obtained on paracentesis.

In regard to the point of contagion, it was interesting to find that in Group II, four of the cases were in one family, two in another, and two more in still another family, while most of the Group I cases were among the nurses at the Deaconess Hospital, but three of these having pulmonary involvement.

COMPLICATIONS

Very few complications were met with among the simple cases, those found being mild sinusitis and otitis media as previously stated. Rather severe pyorrhea occurred in five cases of the second group with some degree of loss of hair in all, none going on to total alopecia. One patient in the second group at the time of discharge still had evidence of atelectasis. Another patient in this group developed Type II pneumonia. Of the fatal cases the patients died with a hemolytic streptococcus empyema, one proved by autopsy, the other by chest paracentesis prior to death.

An interesting case seen and not included in the report because it was not seen during the phase of respiratory infection gave a history of typical influenza and then after five days developed symptoms of peritonitis. At operation, a localized pocket of pus was found under the liver. No cause could be demonstrated for this infection and a pure culture of hemolytic streptococci was obtained from the material. The patient died, but a postmortem examination was not obtained.

It is interesting to note that two cases of Group II had a similar pulmonary infection six to ten months following their initial pneumonia.

TREATMENT

Symptomatic therapy was the only available routine. There was a definite tendency of all patients not to perspire unless given aspirin and they were very uncomfortable with a temperature of 102-104 degrees unless perspiration was induced. Aspirin, grains ten, with codeine, grains one quarter or one half, given three to five times during the twenty-four hours, gave very satisfactory results. Morphia, grain one-eighth or one-quarter, by hypodermic injection, was occasionally used. Nucleotide was given on the advice of a consultant in one case in the second group and a severe reaction followed this therapy. The cough was particularly troublesome and difficult to control. Ortalsodium or phenobarbital taken throughout the day seemed to help by promoting general relaxation of the patient. Expectorants and benzoin inhalants appeared to aggravate the

cough. The fatal cases were too fulminating to allow any thought of surgical intervention and received simply symptomatic treatment.

PROGNOSIS

The question of prognosis is an extremely difficult one. All the cases were identical at onset, and there appeared no way of determining which would terminate in a few days, which would develop chest involvement, or which the fatal complication of empyema. A good prognosis appears to be present in which the picture is typically that of straight influenza with no chest involvement. If there is evidence of chest infection, the prognosis is probably good no matter how sick the patient appears if the leucopenia persists and if the remainder of the clinical picture is satisfactory. The fatal cases developed chest pain, rapidly increasing leucocytosis, and signs of a rapidly advancing process in the chest.

DISCUSSION

There appears to be a specific infection which we now call "influenza". The etiology of this clinical picture is still in doubt. The weight of evidence in the literature in the past has been in favor of the influenza bacillus. However, Francis[1], working in the Rockefeller Institute, and Topley[2], in the London School of Tropical Medicine and Hygiene, have claimed the etiological agent to be a filtrable virus; there is also the possibility that a specific hemolytic streptococcus may be the etiologic agent.

The literature on this disease is extremely confusing, the great bulk of it dealing with epidemics. A clear-cut clinical picture is commonly present only during the early period of the various waves constituting an epidemic. During the height of the waves, the variety of complications is so great that the data collected may be misleading.

The typical case is so similar to what is commonly called "grippe" that the diagnosis is probably not made unless there is a recognized epidemic present. The complications of the typical cases are usually infections of the sinuses and ears. These seldom require surgical treatment other than paracentesis of the ear. Rarely, there may be a true pneumococcus pneumonia as a complication. The cases of pulmonary involvement included in this material were strikingly similar. Many other pneumonias were seen with white blood counts of 6 to 20 thousand and which were not proved pneumococcus pneumonias but whose clinical pictures were so different one from the other that no consistent material could be obtained from them.

With the present available data, it is impossible to state that the cases classified as Group II were not simply complications of influenza. However, their clinical pictures were so strikingly similar and hemolytic streptococci were so commonly found associated with the disease that it is difficult for me to classify them other than as a specific type of pneumonia. They were not seen during the height of a severe influenza epidemic and their similarity thus conforms to the proper time element. The two fatal cases definitely terminated with a hemolytic streptococcus empyema or pleurisy, and undoubtedly also a septicemia.

It appears important to be familiar with the specific picture of what is called simple influenza, and cases showing chest involvement with similar clinical pictures; as well as being cognizant of the possibility of the manifold clinical pictures that can occur once a real epidemic is present and during which a clear resemblance to a specific infection is lost. Prognosis, at the best, is extremely difficult but a more rational attempt can be made if one is familiar with the specific simple case as well as the specific cases with chest involvement. The disease is unusually treacherous because of the complete submission of the resistance of the patient, and there appears to be no way in which to predict the ultimate clinical course.

All patients should be promptly put to bed and the convalescence prolonged well after the termination of clinical activity, no matter how mild the clinical course has been. It is now felt by many that bronchiectasis is definitely a late complication to fear in influenza, particularly in those patients having evidence of infection in the lungs during the active course of the disease.

The following material is presented to illustrate some of the most interesting clinical points.

CASE L. M. The chart is presented to demonstrate a typical temperature and white blood count curve in the cases showing pulmonary involvement. These curves vary only in duration from the curve found in the simple cases. As the temperature curve falls, the white blood count tends to rise and a mild leucocytosis finally occurs. The chart presented is that of a case representing one of a group of four identical infections in a single family.

CASE D. P. The chart is that of a fatal case. The onset in no way varied from that in any other patient. On the sixth day of the disease there was severe pleural pain followed by leucocytosis which rapidly increased to 87,000 shortly before her death. A complete postmortem report follows:

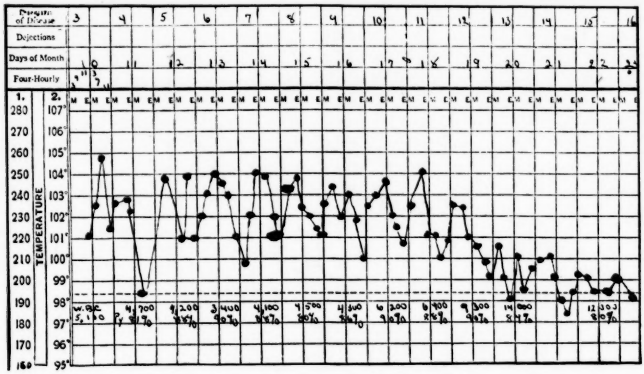
Fifteen and one-half hours postmortem.

Anatomic Diagnoses:

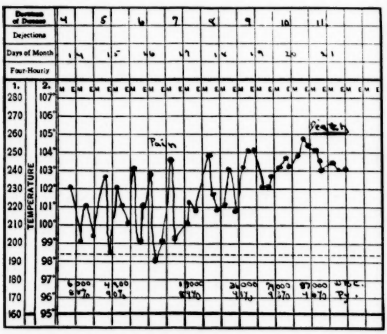
Pleuritis, acute purulent bilateral, with multiple empyema cavities on the left.
Bronchopneumonia.
Pulmonary collapse, left upper and lower lobes.
Pericarditis, slight.
Subdiaphragmatic abscess, small, left.
Salpingo-oophoritis, subacute, left.
Cystitis.
Cholelithiasis.
Cholesterosis.
Head not examined.

The body is that of a slightly obese woman of forty-two years, measuring 167 cm. in length and weighing approximately 160 pounds. There are puncture wounds in both antecubital fossae. The abdomen is protuberant and tympanitic. There is a plentiful amount of subcutaneous fat and the muscles are well developed.

Peritoneal Cavity: On opening the peritoneal cavity the large bowel is found to be redundant and markedly distended with gas. There is no fluid and the peritoneal surfaces are glistening.



CASE L. M.



CASE D. P.

Appendix, Esophagus: Negative.

Stomach: Moderately distended and contains a dirty grayish-brown lumpy fluid.

Intestines: Negative.

Mesenteric and Retroperitoneal Glands: Negative.

Margin of Liver: Well above the costal margin. Diaphragm: Fourth space on both sides.

Pleural Cavities: The right pleural cavity contains approximately 500 cc. of cloudy yellowish fluid with floating particles of yellowish exudate. The pleural surfaces are irregularly covered with loosely adherent yellowish fibrinopurulent exudate and small collections of thick yellowish pus are held in the interpleural spaces. Left pleural cavity: See left lung. The pleural surfaces of both diaphragms show a marked dilatation of the vessels.

Thyroid: Not removed.

Trachea and Bronchi: Slightly injected and are filled with frothy whitish fluid.

Bronchial Glands: Soft and moderately enlarged.

Lungs: Right Lung: The right lung is crepitant throughout. The surfaces are covered with fibrinopurulent exudate. On section the upper and middle lobes are reddish pink with small, ill-defined, slightly raised, indurated areas of the same color. Considerable fluid exudes on pressure. The lower lobe on section is dark red and no induration can be made out. Considerable bloody fluid exudes on pressure. Left Lung: On removal of the chest plate the left lung appears to be partially collapsed. There are approximately 800 cc. of turbid yellowish fluid on which a considerable amount of free yellowish exudate floats. The anterior border of the upper lobe is completely collapsed and held between two partially walled-off empyema cavities. The larger involving the superior lateral aspect measures approximately 15 x 7 x 6 cm. and is full of thick yellowish pus. The smaller is poorly walled off and involves the superior mediastinal pleural surfaces. On freeing the lung from loosely adherent points, a considerable amount of pus escapes from the interpleural space laterally. On section, the posterior and lower portions of the upper lobe are found to be grayish pink and contain several small slightly raised areas, the largest approximately 1 cm. in diameter. The lung in the collapsed upper anterior portion of the upper lobe is a dirty gray color. Section of the lower lobe finds it to be for the most part collapsed with no areas of induration.

Pericardium: Contains approximately 200 cc. of straw-colored fluid with a small amount of stringy yellowish exudate. The parietal pericardium opposite the empyema cavity above described is considerably thickened and there is very slight roughening and injection on the cardial surfaces.

Heart: Weighs 300 Gm. The left ventricle contains a considerable amount of clotted and hemolyzed blood. The right ventricular wall measures 4 mm., the left 12. The mitral valve measures 11 cm., aortic 7, tricuspid 13.5, pulmonary 8.5. They are all negative. There is no evidence of endocarditis.

Coronaries: Negative.

Aorta: Measures: Ascending 7.5 cm., arch 5.5, descending 5. There is very slight atheromatous change.

Pulmonary Artery, Venae Cavae: Negative.

Liver: Weighs 2100 Gm. The surface is smooth, reddish brown and on section is not remarkable.

Gallbladder: Contracted. There is considerable subserosal fat. It contains three rounded papillary greenish stones, the largest measuring 1 cm. in diameter. The mucosa is studded with flecks of yellowish material.

Bile Ducts: Negative.

Pancreas, Ducts: Negative.

Spleen: Weighs 200 Gm. On its superior pole, there is a small collection of yellowish fibrinopurulent exudate which corresponds to a small area on the diaphragm measuring approximately 1 cm. in diameter which also shows adherent exudate.

Adrenals: Not remarkable.

Kidneys: Weigh 350 Gm. The capsules strip with ease, leaving a smooth reddish-brown surface. On section, the cortex measures 7 mm. The markings are distinct. The pelves are negative.

Ureters, Bladder: Negative.

Uterus, Tubes and Ovaries: Small. The right tube and ovary are negative. The left tube appears to be slightly swollen. Its fimbriated end is closed. The left ovary is soft and a cyst approximately 2.5 cm. in diameter which contains thin pussy material is apparently attached to it. The ovary and tube are bound down to the peritoneal surfaces of the pelvis and there is some fibrinopurulent exudate in this area.

Gross Diagnoses:

Diffuse purulent pleuritis, bilateral, with multiple empyema cavities on the left.
Bronchopneumonia, right upper and middle lobes, left upper lobe.
Pulmonary collapse, left upper and lower lobes.
Pericarditis, slight.
Subdiaphragmatic abscess, small, left.
Salpingo-oophoritis, acute, left.
Cystitis.
Cholelithiasis.
Cholesterosis.

Note: There is a peculiar sweet penetrating odor about the body which is most marked in the vomitus but is particularly strong when the pleural cavities are opened.

Bacteriological Examination: Heart's blood and pleura: Hemolytic streptococcus.

Microscopic Examination:

Heart: Negative.

Lung: One section shows a cellular exudate on the pleura with congestion of the underlying lung. There is edema of the lung but no evidence of pneumonitis. Another section shows pneumonitis of the underlying lung tissue with marked cellular exudate. This section shows marked atelectasis.

Liver: There is hyalinization of the arterioles and an increase in polymorphonuclears.

Adrenal: Negative.

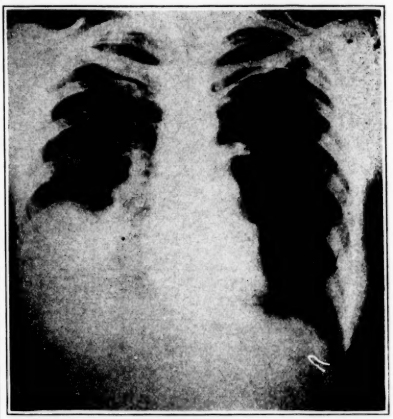
Kidney: There is an occasional hyalinized glomerulus, congestion and cloudy swelling of the tubular epithelium.

Tube and Ovary: Show a subacute inflammatory process with numerous eosinophiles.

Diaphragm: Shows a cellular exudate on both sides and a small amount of lung tissue, the alveoli being filled with polymorphonuclears.

Bone Marrow: Appears to be hyperplastic.

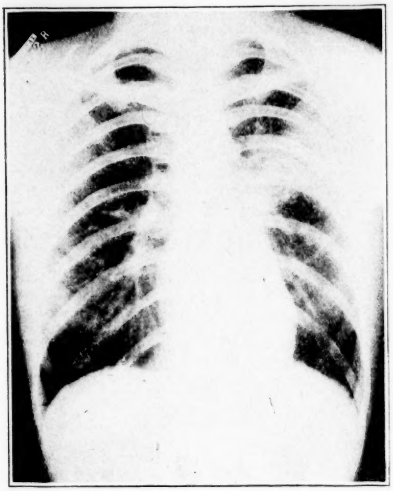
CASE M. H. The accompanying x-ray is presented as the usual radiographic findings in a case with pulmonary involvement. There is nothing specific



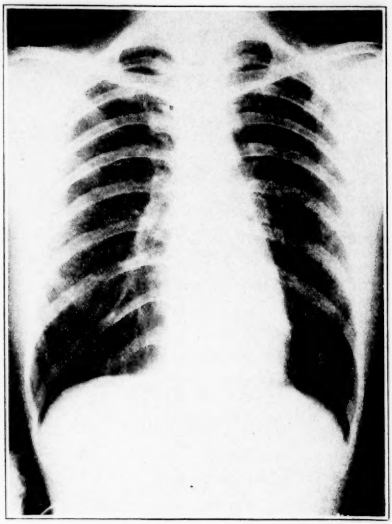
CASE M. H.

in the type of x-ray findings. The area of dullness suggests a lobar distribution. The process cleared in fifteen days without the patient raising any sputum.

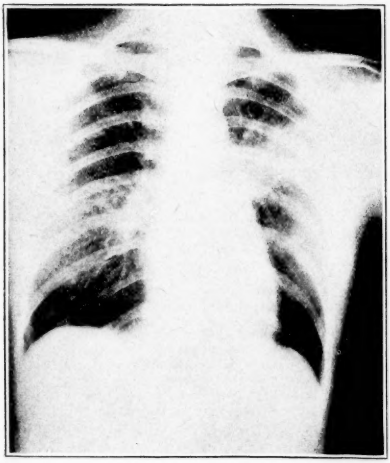
CASE E. R. These x-rays are those of a case with pulmonary involvement. The x-ray findings are of interest and were first diagnosed as being due to tuberculosis. The clinical picture was in no way different from any other case in this group. The first x-ray was taken on admission, showing a lesion in the left infraclavicular area. The second x-ray was taken two days later, showing a spread to the middle portion of the other lung, and the third plate was taken at the time of discharge, after a stay in the hospital of twenty days. This patient was seen six months after her discharge from the hospital. She was well and her chest was entirely clear both by physical examination and by x-ray.



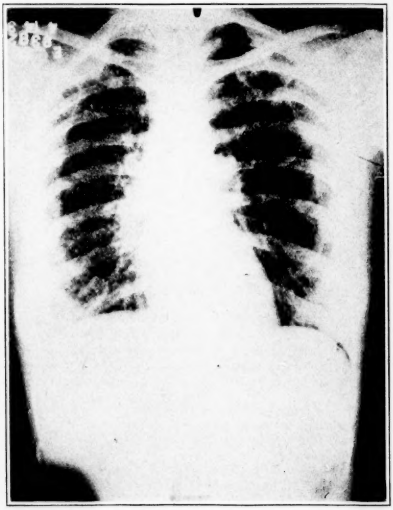
CASE E. R. (1.)



CASE E. R. (3.)

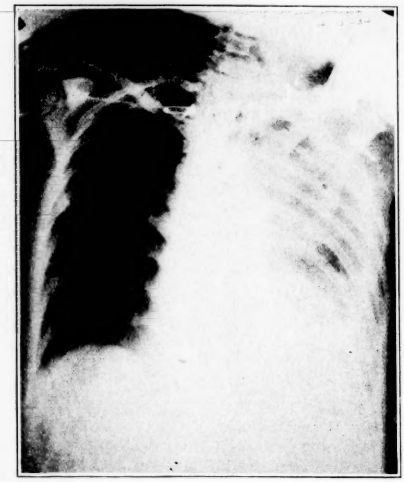


CASE E. R. (2.)



CASE M. K. (1.)

CASE M. K. The accompanying x-rays are those of a fatal case. The first plate was taken on admission; the second plate twenty-four hours later and



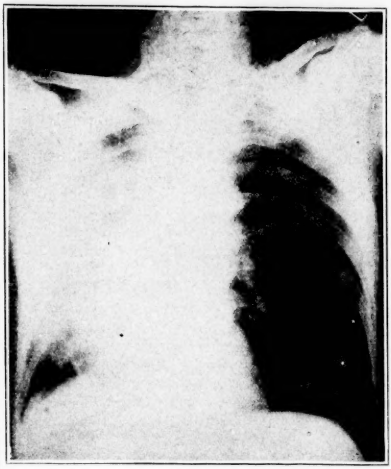
CASE M. K. (2.)

but a few hours before death. They demonstrate how rapidly the process can spread in a short time. The patient had been followed at home for four days and shortly after admission complained of severe pleural pain in the left chest with signs of a rapidly progressive lesion. A chest tap a few hours before death yielded thin pus from which a pure culture of hemolytic streptococci was obtained. Permission for a postmortem examination could not be secured.

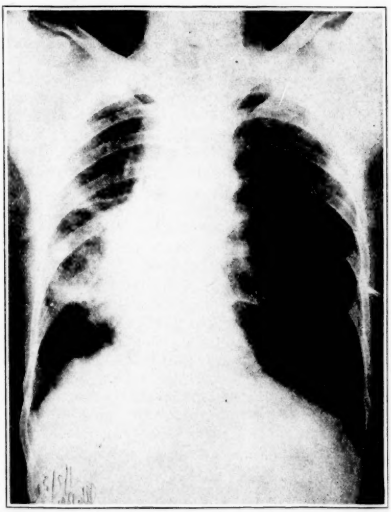
CASE J. M. These x-rays are those of a case with pulmonary involvement. The first plate taken on admission shows an extensive process on the right with a shift of the mediastinum to this side. The second plate was taken six weeks later at the time of discharge. They demonstrate that this type of infection can be a destructive process leaving after it considerable damage. Repeated chest taps failed to find fluid, and at discharge the patient was symptom free. He was seen at home by a house social worker three months after discharge, and the patient stated that he was in good health other than for chronic rheumatism which he had had for many years. However, it is still possible that he may have trouble from the area of atelectasis and scarring which has followed this infection.

SUMMARY

Seventy-two cases of "influenza" are presented, fifty-three or 73.6 per cent being typical "influenza"; seventeen or 23.6 per cent "influenza" with pulmonary involvement; two or 2.8 per cent "influenza" with pulmonary involvement complicated by empyema and a fatal outcome. Of the nineteen cases with pulmonary involvement two or 10.5 per cent developed fatal hemolytic streptococcus empyema.



CASE J. M. (1.)



CASE J. M. (2.)

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A PARTIALLY PURIFIED LIVER EXTRACT THERAPEUTICALLY EFFECTIVE IN PERNICIOUS ANEMIA*

BY Y. SUBBAROW, PH.D.,† BERNARD M. JACOBSON, M.D.,† AND CYRUS H. FISKE, M.D.†

IN the course of experiments on the isolation of the hematopoietically active liver material it was found, in April, 1933, that filtrates of charcoal adsorption on therapeutically active liver extracts were inert in pernicious anemia. Attempts to extract the active material from the charcoal with a variety of eluents were begun in June, 1933. None of the eluents studied, among them isopropyl, butyl, and amyl alcohols, yielded products from different batches of crude liver extract that were consistently therapeutically active. Since September, 1934, elution by means of ethyl alcohol has always resulted in active extracts. Mention of this procedure has already been made in a previous communication[1]. The preparation and biological activity of this material are described in detail in this paper.

Patient Date	J. T. 9/27/34	C. H. 1/16/35	F. W. 1/3/35	A. T. 10/1/35	J. D. 2/20/35	C. H. 2/1/35
Red blood cells in millions per c. mm. at beginning of experimental period	3.51	1.18	2.47	1.07	2.10	1.36
Red blood cells in millions per c. mm. at termination of experimental period	4.07	1.69	2.82	2.42	2.68	2.28
Reticulocyte peak, *per cent*	5.6	10.6	7.8	31.8	11.2	26.6
Length of experimental period, *days*	10	9	9	10	8	11
Total amount of fresh liver, from which administered extract, derived, *grams*	67	72	88	100	103	200
Total amount of nitrogen administered, *milligrams*	8.3	9.4	13.4	12	14	24

The starting point in the preparation is a commercial liver extract‡, in a concentration of 3 cc. derived from 100 Gm. of fresh liver. One hundred and fifty cc. of this extract are dissolved in one liter of water. The solution is brought to pH 8 with NaOH and is then acidified to pH 6 with HCl. Fifty Gm. of norit are added and the mixture is stirred mechanically for one hour, and filtered. The charcoal, washed repeatedly with water until the washings are colorless, is then suspended in one liter of 65 per cent ethyl alcohol, the mixture is brought to the boiling point, stirred mechanically for five minutes, and filtered hot. The elution is repeated once. Both elutes are combined and concentrated under diminished pressure at 40°C. to a volume of 150 cc. (3 cc. per 100 Gm. of liver).

Different batches of the commercial liver extract contain 140 to 180 mg. of total nitrogen, per 100 Gm. of liver, and exhibit a biological activity of approximately 328,000 guinea pig units, per 100 Gm. of liver[2]. The light-brown colored ethyl alcohol elute, on the other hand, contains from 12 to 15 mg. of total nitrogen per 100 Gm. of the fresh liver from which it is derived, and a biological activity of approximately 164,000 guinea pig units. The evidence for the therapeutic efficacy of this elute in pernicious anemia is presented below.

The elute was sterilized by boiling and was administered to the patients by intramuscular injection.

The preparation of the elute described above, and referred to in a previous publication[1], bears similarities to the procedure recently reported by Kyer[3].

SUMMARY

Charcoal adsorption is utilized in the preparation of a partially purified liver extract that is therapeutically effective in pernicious anemia.

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*From the Biochemical Laboratory, Harvard Medical School, and the Medical Clinic, Massachusetts General Hospital, Boston.

This investigation has been supported by grants from the DeLamar Mobile Research Fund, and the Proctor Fund, of the Harvard Medical School, and by Therapeutic Research Grants Nos. 206 and 244 of the Council on Pharmacy and Chemistry of the American Medical Association.

‡Lederle Solution Liver Extract Parenteral Refined and Concentrated, N.N.R. This material was generously furnished by the Lederle Laboratories, Inc., through the courtesy of Dr. Guy W. Clark.

†Subbarow, Y.—Austin Teaching Fellow, Harvard University. Jacobson, Bernard M.—Research Fellow in Medicine, Massachusetts General Hospital. Fiske, Cyrus H.—Professor of Biological Chemistry, Harvard University Medical School. For records and addresses of authors see "This Week's Issue," page 217.

THE MECHANISM AND EFFECTS OF ABDOMINAL COMPRESSION IN THE TREATMENT OF PULMONARY TUBERCULOSIS*

BY BURGESS GORDON, M.D.†

IT is recognized that collapse therapy as induced by artificial pneumothorax, phrenic paralysis and thoracoplasty, is an important measure in the treatment of pulmonary tuberculosis[1]. The immediate effects are decreased cough, expectoration and toxic manifestations, with striking retrogression of the lesions in certain cases. Its value is promptly recognized in patients in whom artificial pneumothorax has been discontinued prematurely. In these, the return of symptoms occurs almost coincidentally with the expansion of the lung.

Similar phenomena have been observed in pulmonary tuberculosis associated with abdominal tumors. A striking example is the abeyance of tuberculosis during the latter months of pregnancy and the subsequent reactivation of the lesion following delivery[2]. A similar parallel occurs in tuberculous women with tumors of the abdomen; with an increase in the size of the mass, the tuberculous process becomes quiescent, but following removal of the growth, even under ideal surgical conditions, there is a reactivation of the infection.

The relationship between the structural development of the body and the activity of pulmonary tuberculosis has been considered since the earliest times. As for example, the long type of chest and the scaphoid abdomen have been associated with the unfavorable cases, whereas the rounded or athletic type of chest, full or well-developed abdomen have suggested greater resistance to the disease. It has also been observed that pulmonary tuberculosis becomes aggravated in young women following a marked loss of weight and the discarding of corsets.

Evidently abdominal tumors and the well-developed abdomen exert an influence on pulmonary tuberculosis not unlike that of phrenic paralysis. However, in evaluating the effects, contributing factors should be considered. As for example, an individual of marked natural resistance would progress more satisfactorily than one belonging to a primitive race, or one suffering from a metabolic disorder such as diabetes or hyperthyroidism. Likewise, no improvement would be expected in patients who have failed to observe a standard dietetic-rest régimen. With these factors recognized, the following hypothesis is proposed in order to discuss the relationship between abdominal conditions and the reactivation and spread of pulmonary tuberculosis: (1) That the disease is influenced favorably by the gradual increase of intraäbdominal pressure which elevates and restricts the movements of the diaphragm and accordingly limits the vertical excursions of the lungs not unlike that in diaphragmatic paralysis; (2) that, with removal of the supporting influence of an abdominal tumor, there is an increase of respiratory activity, less rest for the lung, as would occur with the sudden regeneration of the phrenic nerve and the return of the diaphragm to normal function.

An attempt has been made in a series of 211 patients (collected cases) with fibroid pulmonary tuberculosis to imitate the mechanism of diaphragmatic elevation as it occurs in abdominal tumors[3]. The procedure has been called "abdominal compression". It is accomplished by means of a special abdominal support, consisting of one or two cross-springs and a pad assembly which fit over the lower half of the abdomen, and is held in position by means of a back piece, straps and buckles*. The degree of compression regulates the level and movements of the diaphragm. The supports have been worn from two to thirty months, day and night, except in intestinal tuberculosis and malnutrition when it has been necessary to remove them for short periods; also in certain other instances in order to determine the possibility of retrogression occurring independently of treatment; eighty-two patients have been ambulatory practically throughout the period of observation; thirty-three have worked; the remaining number have had sanatorium care or the equivalent.

Symptomatic relief from dyspnea and difficult expectoration was the rule. Attacks of paroxysmal tachycardia were controlled in three patients; tympanitis and constipation improved in twelve; ninety gained in strength and generally "felt better". The relief of dyspnea and improvement in the lungs were quite constant in patients with an essentially fibroid type of disease and a well-developed abdomen. The unsatisfactory results, such as elevation of temperature with increased cough and dyspnea,

*From the Department for Diseases of the Chest, Jefferson Hospital, Philadelphia, and the White Haven Sanatorium, White Haven, Pennsylvania.

Read before the Harvard Medical Society, Boston, Mass., November 26, 1935.

†Gordon, Burgess—Director of the Department for Diseases of the Chest, Jefferson Hospital, Philadelphia. For record and address of author see "This Week's Issue," page 217.

*The so-called two-spring model was used in patients confined to bed and in those with the flat type of abdomen; the single spring model was used in the pendulous type of abdomen. The supports are manufactured by the Geo. P. Pilling and Son Co., 23rd and Arch Streets, Philadelphia, Pa.

occurred in cases with acute extensions or soft caseating lesions.

The physical examinations in the improved cases usually showed a decrease in the number of coarse râles, especially in the bases of the lungs; it was interesting that musical râles sometimes appeared and persisted but apparently were of no significance.

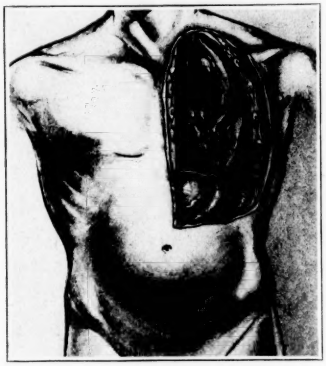

FIGURE 1. A partially collapsed lung suspended by apical and diaphragmatic adhesions, illustrating the ovoidal shape of the cavity during deep inspiration.

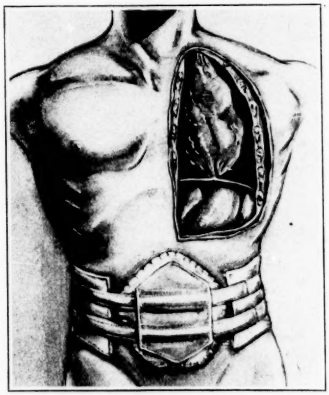

FIGURE 2. Illustrating the effects of abdominal compression with elevated diaphragm and rounded cavity (for comparison see figure 1).

The x-rays showed an average elevation of the diaphragm of 1.2 cm. Structural improvement occurred in forty-three patients (seventeen ambulatory; twenty-six at rest in bed), as evidenced by a decrease in the size of cavities or their disappearance, and retrogression of the associated lesions. The largest cavity before treatment was 4.5 cm. in diameter. Eleven were located in the upper one-third of the lung; five in the middle third; five in the lower third. They closed as follows: one in seven weeks; five in two months; three in three months and seven in five months. The supports were removed in four patients in whom cavities had diminished; an increase of cough and dyspnea followed almost immediately and in about three weeks the cavities returned to their former size. The supports were reapplied and the cavities again diminished in about two months. It was interesting that two apical cavities, which developed during artificial pneumothorax, closed after the lung reëxpanded and following abdominal compression. Twenty-six patients with cavitation and marked fibrosis were able to exercise without x-ray evidence of progression and they seemed to carry their lesions safely. This capacity to exercise safely was more remarkable than any changes that occurred in the lungs, for the reason that the patients had been regarded as suitable only for "cure" such as sitting in a chair.

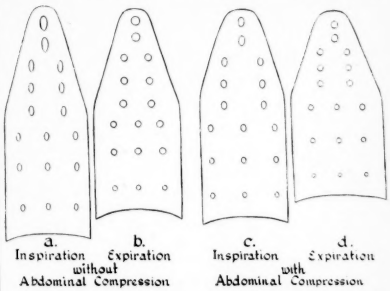

FIGURE 3. Suggesting the possible variations in the size of the apical alveoli during respirations; they tend to become ovoidal during deep inspiration; with limitation of the diaphragmatic excursions by means of abdominal compression they tend to become less ovoidal.

The vital capacity studies in thirty-one patients showed at first a reduction of 10 to 20 per cent, which indicated a decrease in the available air space of the lung, due to a limitation in their vertical movements; with an increase of thoracic excursions, in twelve patients, there was a gradual return to within 5 per cent of the previous figure; in nineteen there was no appreciable change, but it was interesting that eight showed definite symptomatic improvement.

The respiratory rate was studied in thirty patients. In the majority there was an increase of two to five respirations per minute immediately following the application of the support; after wearing it for a few hours, the rate usually returned to the previous figure and breath-

ing became quiet. On slow walking, the rate was more frequently lower with the supports applied than without; on rapid walking the rate increased. The effects on dyspnea were often striking; some patients who were even short of breath while walking on level ground were able to walk up stairs easily.

In discussing the mechanism of abdominal compression as it concerns the tuberculous process, three factors may be considered: (1) the typical pathological development of pulmonary tuberculosis; (2) the possible changes in the lesions, due to deep, uncontrolled vertical excursions of the lungs; (3) pulmonary ventilation as it applies to the growth of tubercle bacilli.

The characteristic development of pulmonary tuberculosis, according to the x-rays and postmortem examinations, begins at the apex of the lung. The lesion is essentially fibrotic. Below the apex the process is typically fibrocaseous with a scattering of new tubercles to the lower lobe, the number of tubercles gradually becoming smaller at the base. The great amount of fibrosis at the apex is an indication of the chronic nature of the lesion and is in marked contrast with the tubercles in various stages of caseation or healing (fibrosis) at the lower levels of the lung. The clinical findings also indicate progressive involvement and correspond with the changes at postmortem. An important feature is the gradual downward extension of the râles, coincidentally with the formation of new tubercles; with clinical improvement there is a gradual disappearance of râles and x-ray shadows beginning at the lower lobe, an indication of clearing of the lung fields.

The pathological development of pulmonary tuberculosis is so typical that one might wonder about the influences in its curious progression. One of these is the mechanical factor of respiration. This is characterized by more or less shallow, rhythmical and equalized excursions of the lungs in different planes. An important feature is that the vertical movements are limited in strong, vigorous individuals and are governed largely by the diaphragm. Their value over deep inspirations has been pointed out repeatedly by women who voluntarily wear abdominal supports or corsets because they feel that the retained abdomen reduces fatigue and facilitates breathing. Except in singers, who require slow, prolonged expirations, the so-called "abdominal" or "diaphragmatic" type of breathing is not encouraged. Deep breathing is usually condemned in athletes because it is tiring and inefficient[4].

The effects of the deep, uncontrolled respirations upon the gross structures of the diseased lung are pointed out by Willauer[5]. He has observed in thoracoscopic studies that a remarkable expansion of emphysematous blebs of the lung occurs during forceful expirations, as in coughing. Apparently a similar phenomenon occurs in bronchial strictures of the "ball-valve" type, associated with cavity formation, in which there is a tendency for air to be "trapped" in the adjacent parts of the lung, causing expansion, especially of thin-walled cavities. The immediate changes in the size of cavities are sometimes shown in fluoroscopic studies of pneumothorax cases in which the lung is held out by apical and diaphragmatic adhesions; with forceful inspirations they become ovoidal in shape, then rounded as expiration occurs. Visualize the endless repetition of these phenomena, of sudden expansions and contractions of blebs, cavities and bronchi in chronic pulmonary disease, and the dangers to the lung will be appreciated. It is difficult to understand how a diseased part can withstand such changes indefinitely, especially in regions unprotected by bone and muscle, as in the apices and mediastinum.

The interesting studies of Walsh[6] throw some light on the microscopic changes of the lungs that may be directly related to the mechanical factor of respiration. He has observed that the alveoli are of the same size throughout the lungs in the still-born infant and in the infant two days old; that they are largest at the apex in the baby four months old; and in the adult they are definitely larger at the apex than at the base. He suggests that the enlargement may be due to greater respiratory activity of the apex. These differences in the size of the alveoli may be shown graphically in an experiment with a triangular sheet of rubber "punched" with holes (figure 3). It may be assumed that the vertex of the triangle represents the upper lobe of the lung; the "holes", the alveoli. The vertex is held more or less firmly to imitate the apex of the lung as it is maintained in position in the thorax by negative intrapleural pressure; as the sheet is stretched, to correspond with the expansion of the lung during inspiration, the "holes" at the vertex become elliptical in shape by contrast with the more or less constant rounded "holes", or "alveoli" at the base. This parallel suggests that the weight of the lung and the suction of the diaphragm play some part in developing larger alveoli at the apex. It may be significant that the permanent enlargement and the intermittent variations occurring with each inspiration, influence the development and progression of tuberculosis.

In considering the possibility that pulmonary ventilation favors the growth of tubercle bacilli, it is interesting to note the behavior of bacteria at different levels of the lung. It is recognized that pneumonia has a predilection for the lower lobe, tuberculosis for the upper lobe; that the pneumococcus is aerobic, but optionally anaerobic; and that the tubercle bacillus is distinctly aerobic. Pneumonia is frequently associated with arteriosclerosis and heart disease, which

have a tendency to produce edema and passive hyperemia of the lower lobe, conditions which interfere with the aeration and circulatory activity of the part; further, that tuberculosis is so uncommonly associated with arteriosclerosis and heart disease as to allow the possibility of an antagonism between them.

The relationship of anthro-silicosis to tuberculosis, on the basis of pulmonary ventilation, may also be significant. It is known that silicate causes marked pulmonary fibrosis and predisposes to tuberculosis and yet patients affected with this dust rarely die of the disease. It seems not unlikely that reduced aeration due to the destruction of myriads of alveoli interferes with the growth of tubercle bacilli.

SUMMARY

The study of signs and symptoms and various mechanical factors of respiration, suggests that the lesions of chronic pulmonary tuberculosis are aggravated by deep vertical excursions of the lungs, difficult expectoration and the traumatizing action of cough. It appears that elevation of the diaphragm as induced by abdominal compression, controls the respirations and equalizes the movements of the lungs in different planes, thereby favoring rest for the diseased parts. The mechanism resembles bilateral phrenicectomy, with the advantage, however, that the propelling force of the diaphragm is preserved, which is of distinct value in expectoration. It is possible that reduced pulmonary ventilation tends to retard the growth of tubercle bacilli as in pneumoconiosis.

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PEPTIC ULCER*

A Study of the Disease Before and After the Demonstrated Ulcer

BY MAURICE A. SCHNITKER, M.D., † AND WM. A. EVANS, JR., M.D.†

PEPTIC Ulcer is commonly considered a disease in which the ulcer in the stomach or duodenum is the essential lesion, without which the disease does not exist. However, there is another conception of the disease in which the actual ulceration is regarded as but one and perhaps not the most important or significant manifestation. Indeed, the disease may be present without any ulceration whatever for shorter or longer periods of time or it may conceivably run its entire course without the appearance of any ulceration. The purpose of our study has been to review the records of patients who had been followed for a considerable period of time during which an ulcer had been observed to develop and to compare the findings before and after the demonstration of the ulcer. According to our views the symptoms were such that we believe the disease was present from the onset of dyspeptic complaints and the appearance of the ulcer was but an incident in its course. As cavitation is but one lesion in the course of pulmonary tuberculosis, similarly we consider ulceration to be but a part of the picture in this disease. A search through the out-patient records of the Peter Bent Brigham Hospital revealed 1653 patients during the past ten years in whom peptic ulcer was suspected clinically. Roentgen studies to establish the diagnosis were carried out in 1376. In 411 the examination was negative, and the majority of these patients were either not seen again or did not have subsequent roentgenological examinations. The diagnosis of peptic ulcer was confirmed at the first roentgenological examination in 934, the ulcer being found in the stomach in 106 and in the duodenum in 828. Thirty-one patients were found in whom one or more roentgenological examinations revealed no ulcer or ulcer deformity of the stomach or duodenum and in whom at a later date an ulcer was demonstrable. The records of these patients constitute the material for this study.

The basis for the diagnosis of an ulcer in a few cases was the actual demonstration of the ulcer itself at operation or as a crater by x-ray. More often, however, the diagnosis was based on the presence of a characteristic deformity which develops in the duodenum. This persistent deformity is generally regarded as direct evidence that an ulcer has been present. We have used the terms ulcer, crater, and deformity interchangeably in the discussion of the paper to indicate the occurrence of an ulcer. We have regarded the period up to and including the last examination showing no ulcer as the period "before" the ulcer. The period "after" the ulcer we have regarded as being that from the time of the first evidence of an ulcer, as described

*From the Medical Clinic of the Peter Bent Brigham Hospital, Boston, Mass.

†Schnitker, Maurice A.—Assistant Resident Physician, Peter Bent Brigham Hospital. Evans, William A., Jr.—Assistant Resident Physician, Peter Bent Brigham Hospital. For records and addresses of authors see "This Week's Issue," page 217.

above. Obviously there must exist between the negative and positive evidence a period of time during which the lesion develops. The manifestations occurring in this period cannot be classified as either before or after the ulcer and have not been considered in this study.

To include brief summaries of all thirty-one cases would add unnecessary length to the paper. In order to give the reader an idea of the type of case analyzed in making this study, we are including only several examples. In the following case reports, data that have not seemed pertinent have been purposely omitted.

CASE 1. S. S., a white male, aged thirty-three, in whom an ulcer was first demonstrated at the age of thirty-one. He had been having typical ulcer symptoms for ten years, i.e., epigastric distress coming one to two hours after meals, relieved by food and soda, and occurring in remissions and relapses. X-ray studies had been carried out in 1923, 1924, 1926, and 1928 and gave no evidence of ulcer. Findings somewhat suggestive but not typical of an ulcer were demonstrated in 1930. In 1933 a typical crater of the duodenum was demonstrated and confirmed on three subsequent occasions. Reëxamination of all the previous films at the present time indicates thickening of the gastric rugae in 1924, 1926 and 1928, with an increase in thickening at the time the crater was demonstrated. The symptoms had remained the same for approximately ten years but became somewhat worse following the demonstration of the crater. There was thought to be a well-marked nervous factor both before and after the demonstration of the crater. Gastric analysis in 1923 before the ulcer showed a range of the free acid from 52 to 108 degrees, and of the total acid from 65 to 128 degrees. In 1933, after the demonstration of the crater, the values for the free acid were 14 to 82, and for the total acid, 41 to 114 degrees. The response to modified Sippy treatment was good before as well as after the demonstration of the crater.

CASE 2. C. H., a white female, aged fifty-six, who was moderately nervous. A duodenal ulcer was first demonstrated at the age of forty-eight. The symptoms had been of four years' duration and were somewhat atypical for an ulcer. The first gastrointestinal x-ray studies in March, 1924 showed some spasm in the stomach and inconclusive findings in the duodenum. A second x-ray study one month later showed a hypertonic stomach and findings in the duodenum less suggestive of an ulcer than before. A third x-ray study in 1925 was entirely negative. A roentgenogram in 1926 was also interpreted as essentially negative. A fifth examination in June, 1926 showed an hourglass deformity of the stomach and a constant irregularity of the duodenal cap typical of a duodenal ulcer. There was no change in symptoms before or after visualization of the duodenal lesion. A gastric analysis in 1924 before the ulcer (one specimen) showed a free acid value of 30, and a total acid value of 54 degrees. In 1926, with the demonstration of the ulcer, the values were 5 to 50, and 30 to 65 respectively. The response to treatment with diet and powders was poor before the ulcer was demonstrated; an operation after the ulcer was found failed to give relief.

Certain objections to the significance or actual existence of such a group immediately arise. The small size of the group would appear to be due in part to the fact that patients did not present themselves until their disease had been present for a considerable period of time and was then well advanced; and in part to the fact that some patients with negative roentgenological examinations were not followed further and were dismissed as having a disorder of no importance. The possibility that these patients simply represent ones in whom an ulcer was overlooked at the first x-ray examination cannot be easily denied and this may be true particularly in a few cases in which the initial examination was done before the present accuracy of diagnosis had been attained. A further objection is the possibility that during the apparent ulcer-free phase of the disease, a crater may have been present at some point in the stomach or duodenum where it could be demonstrated only with great difficulty, if at all, and that the appearance of a demonstrable ulcer was no more than the appearance of a second ulcer in a location more favorable for demonstration. It is well known that small ulcerations on the posterior wall of the stomach are particularly difficult to demonstrate even with the newer methods of relief study of the mucosa and their presence cannot be readily denied without gastroscopic confirmation. However, where a number of our patients were submitted to repeated examinations which were negative and then, with the same technique carried out in the same department, a crater or deformity was demonstrated at a later date, we feel that the ulceration actually developed in the interim. A final possibility is that these patients had previously had peptic ulcers which at the time of the negative examination had healed without a deformity and which later recurred. This possibility obtains particularly in the case of gastric lesions. Thus Nicholas and Moncrieff[1] have pointed out that in the recurrence of a gastric ulcer, symptoms may reappear before a crater becomes demonstrable roentgenologically. Notwithstanding these alternative explanations which quite possibly represent the facts in a few cases, we have assumed the group as a whole to consist of patients who were observed at a period in their disease before any ulcer had appeared. In a few cases the films are available for reëxamination and confirmation of the presence or absence of an ulcer so far as this is possible.

The thirty-one cases fall into four groups. The first of sixteen patients consists of those in whom the first Roentgen studies were entirely negative so far as the stomach or the duodenum was concerned and in whom a duodenal ulcer was demonstrated subsequently. The second group contains two patients in whom a gastric ulcer appeared. In the third group are two patients in whom the evidence is in part surgical. In one, two exploratory laparotomies by experienced surgeons gave no evidence of a peptic

ulcer although the stomach and duodenum were carefully examined on both occasions, a duodenal ulcer finally being demonstrated roentgenologically four years after the last laparotomy. In the other, four roentgen examinations over a period of five years failed to reveal a crater or the deformity of one, while the presence of a duodenal ulcer was later established by laparotomy. The final group of eleven patients consists of those in whom the first barium studies were regarded as doubtful because of a transient deformity or irritability of the duodenal cap. In these patients, no crater or constant deformity could be made out in the initial examinations although a typical duodenal ulcer was demonstrable at a later date. In retrospect, evidence in these cases would indicate that the lesion present at the time of the early examinations was a duodenitis.

In studying the records of these patients an attempt was made to compare the symptomatology of the disease before and after the appearance of the ulcer. Particular attention was paid to the nervous make-up of the patient, to the character and severity of his symptoms, any evidence of bleeding or perforation, and the response to treatment. When possible, comparison was made of the acidity of the gastric juice in the two periods. In addition, a note was made of manifestations which may be associated with the ulcer syndrome[2], i.e., inflammatory lesions in the gastrointestinal tract (gastritis, duodenitis, colitis) and disturbances of motility (cardiospasm, pylorospasm, diarrhea and constipation). In some patients, the symptoms appeared to arise in large part, if not entirely, from one or another of these associated lesions at the time when no ulcer was demonstrable.

DISCUSSION

It is not unusual for a case to come to necropsy with a peptic ulcer or the scar of one, the patient never having had symptoms suggestive of that disease[3]. Similarly, in the course of another study we have recently observed three patients with Roentgen evidence of a penetrating ulcer who had not had symptoms of their disease for months. It is unusual to observe patients with a crater without symptoms for the obvious reason that in the absence of symptoms Roentgen studies are not made. That an individual may have symptoms typical of ulcer distress without a demonstrable crater is generally recognized. Alvarez[4] has given the name "pseudo-ulcer" to such cases. In some of these individuals after a period of such symptoms an ulcer develops. These facts seem to indicate that there is no necessary correlation between the presence of a crater and the peptic ulcer symptomatology. The few writers on this phase of the disease have not stated what the time interval of symptoms may be before the ulcer develops, although Norpoth[5] reported three cases with symptoms for four, seventeen, and nine years respectively before the ulcer was demonstrated. Somewhat similar to the studies we have carried out, the first x-ray examinations in all three of his cases showed thickened rugae and no ulcer, and from five to sixteen months later, a second examination revealed a duodenal ulcer in two patients and a gastric ulcer in the other. In our series of thirty-one cases we found the period of symptoms before the ulcer was demonstrated to be from one to twenty-five years. The average for the group was 9.1 years but in the majority it was twelve to fifteen years. The time interval between consecutive x-ray examinations varied a great deal, the probable explanation being either that the physician minimized the symptoms or that the patient was reluctant to have another barium study if the first was reported negative. In ten of the thirty-one cases there was more than one negative Roentgen examination before the demonstration of the ulcer; one case had had five negative reports over a period of seven years before the ulcer was seen.

This group of thirty-one cases was analyzed to determine whether these individuals differed in any respect from the average patients with an ulcer. There were more males than females, a sex incidence not unusual for ulcer disease. In twenty-nine the ulcer was located in the duodenum and in two it was in the stomach. Most of the individuals were in the later decades of life when the ulcer became manifest. The range of age was eighteen to sixty-nine, nine of the patients being over fifty years of age and nineteen over forty. These patients appeared to be of about the same age at the time the ulcer developed as is the case with average groups of patients with ulcer.

In the records of twenty-five patients when a statement had been made, there was distinct nervousness in twenty. The frequency and degree of nervousness in this group seemed to be the same as in a group of average ulcer cases. This seemed of interest inasmuch as one might be tempted to explain the existence of such a group on the basis that these individuals were perhaps more nervous and meticulous and hence would seek medical advice sooner than do most persons.

The cases were studied further to compare the findings before and after the demonstration of the ulcer. One of the most striking features was the absence of appreciable changes in symptomatology with the presence of the crater or deformity. In a few cases there were other disorders of the gastrointestinal tract, but even then, there were additional symptoms in most cases quite typical of ulcer distress. In four cases the symptoms were somewhat atypical but

they were of the same character after the ulcer developed. In one there was an irritable colon and in another gallbladder disease which may have contributed to the bizarre complaints. In most of the individuals the symptoms were of the same character and severity throughout the course of the disease. In three there was an increase in intensity at the time the ulcer was found. In two cases the symptoms were actually more mild at the time an ulcer was demonstrated and so far as we could tell this was not the result of previous symptomatic treatment. There appeared to be a high incidence of night pain, its presence occurring in seventeen of the thirty-one individuals. In eleven of the seventeen this type of pain was present before the ulcer was demonstrable. If the universal teaching is accepted that night pain is more characteristic and more commonly found in duodenal than in gastric ulcer, the high incidence of night pain would appear to be due to the fact that twenty-nine of our cases were of duodenal ulcer.

Compared to larger groups of average ulcer cases there did not appear to be any appreciable difference in the frequency of nausea, vomiting, bleeding or perforation. It is well known that an x-ray examination of the stomach or duodenum often does not reveal an ulcer at the time of bleeding and it may not be found for some time after the bleeding has ceased. Crohn, Weiskopf and Aschner[6] consider such cases of so-called "essential" hematemesis which later have an ulcer to be in the "regressive" phase of the disease. However, it is well known among gastroscopists (Korbsch[7]) that bleeding may occur from small areas of inflammation in the mucosa where no ulcer is present. Six of our cases had evidence of slight bleeding at a time when no ulcer was demonstrable by Roentgen examination. After the ulcer was present there was additional bleeding in two of these and in three others. The occurrence of bleeding in a total of nine cases (twenty-nine per cent) is not an unusual figure and agrees very well with the studies of Emery and Monroe[8] of two much larger series of cases where the incidence of bleeding was found to be 26.7 and 34.8 per cent respectively.

Another point of interest was a comparison in the level of gastric acidity before and after the appearance of the ulcer. In nine of the cases an analysis with the Ewald meal had been done before the ulcer appeared and in four of these the free acidity was high, i.e., in at least one specimen it was over 50°. In one case the free acidity was as high as 108°. In one case there was no free acid present in the gastric contents after the Ewald meal; the response to histamine was not tried. The gastric analysis in these nine cases after the ulcer was present showed no appreciable difference from the previous tests in seven; in one case the values were slightly higher and in the other both the free and total acid levels were definitely lower. In the remaining twenty-two cases, four had tests only before and nine only after the appearance of the ulcer. In nine of these thirteen the acidity was high and in four it was normal. In the total group of twenty-two patients in whom a gastric analysis was carried out, there were eight with a normal acidity, i.e., F. A. 5-50°.

In reviewing the available films of these cases, we attempted to determine the presence of thickened gastric rugae. In 1829 Cruveilhier[9] reported chronic peptic ulcer as an entity distinct from cancer of the stomach and chronic gastritis. He gave a clear anatomic and clinical description of the disease suggesting as a primary lesion preceding inflammation. More recently that association has been stressed particularly by Konjetzny[10]. With the newer methods of gastroscopy, thickened rugae have been found to be a characteristic feature of the gastritis of ulcer disease. This thickening of the rugae can be estimated from a film of the barium filled stomach. However, from our studies we feel one cannot make a diagnosis of ulcer disease from the presence of thickened rugae alone. We found that the average trend in about half of the cases was a slight but definite increase in the thickness of the rugae up to the time of the demonstration of the ulcer. This definite progression occurred in twelve of the twenty-five cases in which the films were available; in three others such an increase was questionable. In four the rugae were slightly thickened at the first examination and they appeared unchanged at the time the ulcer was seen. In four other cases the rugae appeared normal throughout all the x-ray studies. It was rather striking that in two cases the rugae were definitely less tortuous and thickened at the time of the ulcer than on previous films.

Since most of the patients were given a bland diet, alkaline powders and milk on some schedule for the alleviation of symptoms, even when the x-ray was negative for ulcer, we were able to draw some conclusions as to the response to symptomatic treatment both before and after the ulcer was demonstrated. In many instances, of course, a more strict régime was outlined and followed after an ulcer was found. Grading the response to treatment as poor, fair, and good, we found that before the ulcer, five did poorly, six did fairly, and eleven responded well. In nine cases there was no note from which to judge the response to treatment. After the ulcer appeared and often a more strict régime was instituted, one did poorly, thirteen did fairly, and fourteen had a good response to treatment.

In three cases this information was not available. Of the twenty-two cases then, in which we have data before and after the ulcer, there was a better response to symptomatic treatment in four, in two it was worse, and in sixteen the same with the demonstration of the ulcer. Similarly, as there was little change in symptomatology and no appreciable difference in gastric acidity, so there was also little variation in the response to treatment before and after an ulcer was found to be present.

CONCLUSIONS

A study has been made of thirty-one patients with peptic ulcer who were seen in the period of the disease when no ulcer was demonstrable. A comparison was made of the findings before and after the demonstration of the ulcer.

There was no striking change in the character or severity of the symptoms with the demonstration of the ulcer. Likewise there was no constant variation in the gastric acidity, in the incidence of bleeding, or in the response to symptomatic treatment in the two periods of the disease.

Roentgen evidence of inflammatory lesions (gastritis and duodenitis) was present in the majority of the cases before the demonstration of the ulcer and later there was generally an increase in the severity of these lesions. In some cases, however, no evidence of inflammation was obtained either before or after the ulcer was seen. We do not believe that a diagnosis of peptic ulcer can be made on the basis of tortuous and thickened rugae alone.

These findings give support to the view that an ulcer of the stomach or duodenum is simply the local manifestation of a more general disorder. They also confirm an impression that a crater, as demonstrated roentgenologically, is but an incident in the course of the peptic ulcer disease.

We wish to acknowledge the kind help given to us by Dr. W. W. Vaughan from the Department of Roentgenology in reviewing the films in this study.

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VERMONT STATE MEDICAL SOCIETY

DERMOID TEETH IN THE EXTERNAL AUDITORY CANAL, WITH COMMENTS ON TERATOMAS AND DERMOIDS IN GENERAL*

BY GEORGE G. MARSHALL, M.D.†

BECAUSE of the rarity of dermoid teeth being found in the external auditory canal, and because of the mystery and interesting theories of the production of dermoids and teratomas, associated as they are with the disorderly cell life in their production, as well as that of malignant tumors, I have chosen this as my subject with a report of three cases, the first of which recently came under my observation. One other case is reported by Becco of Argentina[5], and one of simple dermoid in the auditory canal is reported by Adam and Gilmour of Glasgow[4].

CASE 1. Report of my case: R. C., aged fifteen, first seen September 6, 1934. Referred by Dr. Briggs of Brandon, Vt., because of increasing deafness of the right ear. There had been no pain or aural discharge, but the patient had noticed an obstruction in the external auditory meatus. On an office examination there appeared to be an exostosis, covered by a cutaneous membrane, filling the aural canal so completely that only a thin instrument could be introduced beside the bony growth. On October 8 he entered the Rutland City Hospital for removal of the growth. Under ether a more thorough examination being made, to determine the supposed attachment, it was noticed that the tumor was movable. A small hook was then passed along the side of the canal, until it engaged back of the tumor, when the tumor was extracted by gentle manipulation, and to our surprise, on examination it proved to be a molar tooth. Then on looking into the canal, to determine its condition and especially that of the drum, another similar tumor was seen deeper in the canal. This one also was movable and had a thin epithelial covering. The hook was then worked back of this growth and extracted as in the first case. This tumor also proved to be an imperfect molar. After cleaning the canal of what appeared to be sebaceous material, the drum was found to be normal. The canal showed some pressure necrosis, but there were no sinuses. After a week the parts had regained a healthy appearance, with restoration of normal hearing. Radio-

*President's Address delivered before the Vermont State Medical Society at the Annual Meeting, Rutland, Vermont, October 17, 1935.

†Marshall, George G.—For record and address of author see "This Week's Issue," page 217.

graphs of the jaw by his dentist, Dr. William Pond, showed the right lower third molar missing, and the left lower third molar lay horizontal and unerupted. (Slides of the dermoid teeth shown. Figure 1.)

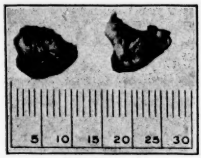

FIGURE 1.
Photo of extracted teeth from Case 1.

CASE 2. Reported by Raul Becco, Chief of the Service of the Otolaryngological Department of the Italian Hospital of Argentina[2]. The following is taken from Becco's report. A boy born in Florence, Italy, who, at the age of fifteen, first noticed an obstruction in the left ear, for which he consulted an aural surgeon, was informed that he had an exostosis in the aural canal, and operation for its removal was advised. Since there was no discomfort other than a slight loss of hearing, operation was declined. Four years later, in 1923, he emigrated to Buenos Aires, where he had increasing trouble; hearing became more defective and he had periods of purulent fetid discharge with frequent pain in the ear and severe intermittent headache. For these symptoms he visited several service hospitals, and, at each, operation was advised. In 1928 he first consulted Dr. Becco, who found what he thought was an exostosis, nearly filling the auditory canal, complicated by a purulent discharge. The patient now entered the Italian Service Hospital, and on March 5 Dr. Becco operated. Incision was made, postaurally, and it was planned to chisel away part of the bony canal, but the tumor was found to be movable, and was easily extracted with forceps. On examination it proved to be an imperfect molar. There were no sinuses in the canal. He made a good recovery, but with defective hearing owing to the injured drum from long pressure and secondary infection. Dr. Becco in his report says that he has searched the medical literature extensively and has not found a similar case recorded, although there were many references to dermoid cysts in the outer ear and mastoid[2].

CASE 3. Reported by Adam and Gilmour[4]. They preface their report by saying: "The rarity of this sort of tumor is sufficiently shown by the fact that it is not mentioned in aural textbooks, but it has pathological implications that render the case worthy of record."

They report as follows: A woman, aged sixty-five, first seen in 1928. She had known of a growth in her right ear for eighteen years. At this time there was no pain or discharge, but the hearing was very defective. In October, 1929, she was having pain in the ear, giddiness and purulent otorrhea. She was now taken to the Stobhill hospital, and after the usual postauricular incision, the meatal wall was split and a dermoid tumor delivered. The pedicle, which was attached behind the angle of the jaw, was easily severed. The postaural wound healed by first intention, and the suppuration from the middle ear ceased. The tympanic cavity was not visible, owing to the changes brought about by pressure of the tumor. The dermoid was covered with epidermis and was so firm as to be at first mistaken for an osteoma.

In Adams' opinion this was a dermoid growth from the first branchial cleft.

Misplaced teeth have often been found in the antrum, more rarely in the orbit, and dermoids containing teeth, together with recognized tissues from any of the three germ layers are found in many parts of the body.*

The first case here reported is I believe the first instance of dermoid teeth being found in the aural canal recorded in American literature. The second is the only recorded case that I have been able to find in foreign literature. The third case, reported from Edinburgh, is similar, but no teeth were found in the dermoid. It is possible that some cases diagnosed as exostosis may have been dermoids.

CONSIDERATION OF TERATOMAS AND DERMOIDS IN GENERAL

Definition: A teratoma is a tumor composed of tissues and complex organs derived from more than one germ layer, and may be located in parts foreign to the tissues of which it is composed. A dermoid is an imperfect teratoma composed chiefly of the ectodermal germ layer. The tissues in either case are disorderly arranged and without physiological purpose, composed of either mature or embryonic cells, the latter showing a strong tendency to malignancy[6].

History: In the Middle Ages a dermoid was thought to be a malformed fetus, and to be the judgment of God for immoral practices, but in 1789 Baillie reported an ovarian dermoid in a virgin girl, aged eleven, and from then more rational explanations were attempted.

Etiology: While there is no proved cause for the production of teratomas and dermoids there are a few theories that seem acceptable. First: The defective closure of certain embryonic clefts with inclusion of cells from the ectodermal layer; this takes place in the fifth or sixth week of embryonic life. The branchial clefts of the neck are one of the most common sites, and faulty closure of the first branchial cleft offers the best explanation of the dermoid teeth in the cases here reported.

Inclusion error of the neural groove with infolding of the ectodermal layer may give rise to spinal dermoids. Fraser of Edinburgh[1] reports such a case.

The following paragraph will help to clarify the *second theory*, that of misplaced blastomeres. A blastomere is one of the cells resulting from the first few divisions of the fertilized ovum. Those resulting from the earliest division are called totipotent, since they can produce any tissue of the body. They differ from

*Dermoids have been reported as having been found in the following regions, orbit, cornea, conjunctiva, brain, frontal sinus, parietal bone, anterior wall of the rectum, pelvic connection tissue, pancreas, nose, terminal phalanx of the thumb, sacrococcygeal region, mesentery, umbilicus, vaginal canal, round ligament, wall of the Fallopian tube, ovary, scrotum, perineum, neck, ears, sternum, pleural cavity and floor of the mouth.

blastomeres of further divisions, which are called multipotent, and evolve many tissues, though not all, and finally cells from further divisions are called unipotent, because they are capable of building but one kind of tissue[8]. According to this theory one of the blastomeres becomes misplaced during the embryonic period and usually remains dormant until some time in adolescent or adult life if not permanently. The complexity of the teratoma is determined by the type of blastomere displaced. Ewing says: "The possibility must also be considered that the formative capacity of anatomically pure germ layers may not always be restrained within the rigid limits formerly set."[6]

Third theory: Aberrant or wandering germ cells in the developing embryo are found widely scattered, the length of the embryonal entoderm, and these aberrant cells are thought to be one of the most frequent causes of teratomas, especially those occurring in the sex organs. The delayed development of these undifferentiated cells should not be considered strange since we have normal examples of delayed cell changes, like the successive eruption of teeth, the activity of hair follicles at puberty, and other equally familiar cases.

There has been much research in an effort to determine why certain groups of cells start on an uncontrolled proliferation in the production of benign and malignant tumors. There is an inherent tendency in all cells to multiply, and the tailed cell or spermatozoa, discovered in 1677 by Hamm, but whose function was not proved until 1844 by Wagner and Koelliker, is not the only means of cell fertilization or division.[2] For example, Loeb induced starfish eggs to segment by adding soda water to sea water, called shock fertilization, and later Batallion induced complete embryogenesis in frogs' eggs by pricking them with a glass stylet dipped in the frogs' blood.

One of the most interesting theories of cell multiplication is known as Parthenogenesis, a normal process of automatic cell proliferation in the lower forms of vegetable and animal life. An example is that of the sea urchin's egg. More speculative is the theory of tissue cell fertilization by conjugation with leukocytes. (Kefts.) Trauma is probably one of the most frequent causes for activation of these misplaced cells. Ewing says, "There is abundant evidence that not only chronic irritation, but that single or multiple direct injuries may excite malignant growths in predisposing unstable cells."[6] Recent experimental work by Crile[7] reported in the *American Journal of Surgery,* in May, 1931[10], confirms that trauma may excite pathological growth in normal cells. He says: "Cancer cells are normal cells so structurally altered by mechanical, chemical or radiant energy that they are partly or wholly bereft of their normal function, and their power to multiply is correspondingly increased." He adds, "A cancer cell is an injured normal cell."

These are a few of the many interesting theories advanced to explain the abnormal growths known as teratomas and dermoids, as well as that of malignant cell activity.

Diagnosis of teratomas and dermoids is often difficult, the history and physical appearance, together with radiographs will in some cases be sufficient, but often the true nature cannot be determined until operation and microscopic section.

Prognosis: Dermoids and teratomas continue to increase in size by cell proliferation, and the accumulating débris from the epithelial layer, so that by simple pressure they may encroach on vital organs, causing great distress and may even prove fatal. Dr. S. W. Harrington of the Mayo Clinic reports cases of mediastinal teratomas that by pressure invaded the lung causing dyspnea, and the expectoration of hair from the ruptured teratoma. In one of his cases the mediastinal teratoma penetrated the diaphragm involving the liver.[7]

Both teratomas and dermoids are prone to infection. Finally, a teratoma, especially of the embryonic type, may become malignant, forming metastasis. Gibson and Arnold[9] report a case of metastasis into the neck from a malignant teratoma of the testicle, the metastatic tumor being found before that of the original malignant teratoma.

Treatment: Cases like the three here reported obviously should be operated early for the preservation of hearing, the prevention of pressure necrosis and late infection. The early, thorough operative removal of teratomas and dermoids should be advocated in all cases, since there are these three dangers which have already been mentioned under the head of prognosis, namely, pressure necrosis, secondly, infection and thirdly, malignancy.

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MISCELLANY

VERMONT DEPARTMENT OF PUBLIC HEALTH

DECEMBER, 1935

The following communicable diseases were reported to the office of the Department of Public Health during the month of December: chicken pox 501, diphtheria 4, measles 534, German measles 72, mumps 173, poliomyelitis 4, typhoid fever 2, scarlet fever 57, undulant fever 2, whooping cough 191 and tuberculosis 10.

The Laboratory of Hygiene made 1,503 examinations, the details of which are as follows:

Examinations for diphtheria bacilli	92
" " Widal reaction of typhoid fever	30
" " undulant fever	43
" " gonococci in pus	131
" " tubercle bacilli	141
" " syphilis	562
" of water, chemical and bacteriological	57
" " water, bacteriological	235
" " milk, market	117
" " milk, submitted for chemical only	1
" " milk, submitted for microscopical only	8
" " foods	3
Examinations of drugs	0
" for courts, autopsies	3
" " courts, miscellaneous	9
" miscellaneous	68
Autopsies to complete death returns	3

The Director of the Division of Venereal Diseases reports twenty-nine cases of gonorrhea and forty-one cases of syphilis made to this Division in December. Eight hundred and four Wassermann outfits and three hundred and forty-four slides for gonorrhea were distributed from this Division.

The After-Care Nurses of the Infantile Paralysis After-Care Division made eighty home visits, calling on eighty-two patients. Five patients were admitted to the Audubon Hospital and six patients were discharged. Three patients were admitted to the Children's Hospital and one patient was discharged. Thirteen pieces of apparatus were fitted, two pieces of apparatus were repaired and six orthopedic corrections were made to shoes. The Vocational Worker of this Division reports sales made, amounting to $49.50.

Five towns of the state were visited by the State Advisory Nurse of the Public Health Nursing Division. Part of the nurse's time was devoted to the WPA project, and the making of plans for a second project. Nine hundred and thirty-three notifications of birth registration and three hundred and forty-one pamphlets were mailed out in December.

MEDICAL PROGRESS

PROGRESS IN UROLOGY, 1934

BY FLETCHER H. COLBY, M.D.*

CANCER *of the bladder* has always been a difficult problem. Through the work of the Carcinoma Registry of The American Urological Association sufficient important data have been collected during the last seven years to warrant a review of the 902 reported tumors. The committee on carcinoma registry has studied this large series of cases and has made available many valuable facts in its report[1].

These neoplasms were considerably more common in men than women. The incidence was 76.25 for the male and 23.75 for the female.

Over half of the cases registered occurred between the ages of fifty and sixty-nine with the age peak between sixty and sixty-four. In only five patients were tumors present before the age of thirty and but ten after eighty years of age. It has been said that tumors in the extremes of life, the very young and aged, are of higher malignancy than others but the material of the registry does not tend to bear this out.

A study of the occupations of the patients included in the report revealed no significant feature except for the occurrences of sixteen epithelial tumors of the bladder among anilin dye workers. The high incidence of bladder cancer among individuals exposed to the anilin compounds has been a recognized fact for many years. Except for these cases no facts presented themselves which could be interpreted as causative factors in the etiology of carcinoma of the bladder.

Certain facts relating to some of these tumors suggest that they originate in the basal layers of the epithelium, about the terminal blood vessels, and they may reach a considerable size before the superficial layers of the epithelium are destroyed. These findings also suggest that some bladder tumors may originate as a result of certain cancerogenic agents circulating in the blood, thereby affecting the entire bladder mucosa. These facts apply more particularly to the anilin tumors, but the committee found that the distribution of both single and multiple tumors, as noted in the registry, appeared to follow closely the vascular supply of the deeper

*Colby, Fletcher H.—Assistant Visiting Urologist, Massachusetts General Hospital. For record and address of author see "This Week's Issue," page 217.

layers of the epithelium. The high incidence of multiple tumors (29.2 per cent) was also considered suggestive in this respect.

A study of the situation of these tumors showed that the majority (76.6 per cent) arose from the lateral walls, trigone and bladder neck. This fact is of great importance since only the remaining 23.4 per cent of the growths involved portions of the bladder which would permit wide surgical excision without damaging the urethra or one of the ureters. This high percentage of invasion of the less mobile and less accessible portions of the bladder constitutes one of the chief difficulties in adequate treatment of bladder cancer.

Correlation of the location of the tumor and the degree of malignancy brought out a significant fact. Tumors involving the vault were usually highly malignant (75 per cent grades III and IV). The incidence of metastasis for this location was also greatly increased. Tumors which arose from the lateral wall, trigone or bladder neck were less likely to be so highly malignant (53.4 per cent were grades I and II), and in this type of growth the percentage of five-year cures was considerably higher, as contrasted with vault tumors. With the exception of the vault tumors, this series showed that the location of the primary growth had little apparent relation to the prognosis.

Multiple tumors were found likely to be of lower malignancy than single tumors. In many instances of recurring tumors it is believed that the new tumors represent true new growths originating in multiple foci in the bladder mucosa rather than that they are recurrences. Some of these multiple tumors were proved to be clinically malignant although histologically apparently benign.

Metastasis probably occurs in bladder tumors more frequently than is generally supposed. Approximately 10 per cent of the cases in this series showed metastases to the bones, lungs, regional lymph nodes and other locations. The incidence is undoubtedly higher than this since many of the cases included in the series were not examined for metastases. Other writers speak of this[2, 3].

The registry adopted this simple classification of the epithelial tumors:

I. Papillary carcinoma.
II. Infiltrating carcinoma.
III. Unusual types of epithelial tumors:
  a. Adenocarcinoma.
  b. Colloid carcinoma.
  c. Adenoma malignum (intestinal origin).

The tumors were graded on the basis of Broder's classification, and it should be noted that the histologically benign papilloma is included in the grade I papillary carcinoma group.

That there is still a considerable delay between the onset of the initial symptoms and sufficiently adequate examination to make a diagnosis of bladder tumor, is quite evident in this series. In nearly one half of the patients (48.3 per cent) the diagnosis was delayed for more than one year. Only 10.8 per cent were completely examined and the diagnosis established, within one month of the initial symptom. Even so striking a symptom as hematuria was disregarded for over one year in 46.45 per cent. In other words, the importance of hematuria has not yet been appreciated by the layman or the doctor.

The standard methods of treating the cases in this series were resection, fulguration and radiation. The committee found it impossible to compare the results obtained from the various kinds of treatment. Of 349 cases observed five years or more, 33.24 per cent were alive at the end of five years.

Stone formation in the urinary tract is a subject of surpassing interest. The disease was prevalent in the human race centuries previous to the most ancient medical records and the earliest urinary calculus was discovered in Egypt among the bones of a boy of about sixteen. The grave is said to have belonged to the middle or late-middle prehistoric age some generations at least before the advent of Merres, the first Dynastic king (about 4800 B.C.)[4]. Analysis and study of this stone demonstrated that it was similar to those of the present day which occur in certain parts of India. Is the etiology of stone shrouded in mystery now as much as in the day of this earliest known sufferer, or has progress been made in solving this very important problem?

Stone was very common in Europe during the Middle Ages and until the beginning of the 19th century. Children were particularly afflicted with the disease. Still, in some parts of the world, particularly Southern China and certain portions of India, urinary calculus has a very high incidence. As better food conditions prevailed in Europe this tendency to stone formation declined. Vitamin deficiency, then, played an unquestioned part in stone formation. It is difficult, however, to account for all instances of the disease on this basis, convincing as are certain of the facts brought out by the artificial production of calculi in laboratory animals which have been kept on low vitamin diets.

Again, urinary stasis and infection have a bearing on stone production. The incidence of calculi is considerably higher when the normal flow of urine is obstructed, such as in the various congenital abnormalities of the urinary organs, hydronephrosis, horseshoe kidney and developmental obstructions of the urethra. Vesical calculi are frequently present in the bladder obstructed by the enlarged prostate, and stones are often found in bladder diverticula. In these conditions obstruction appears to be an obvious factor in stone formation.

Infection is difficult to evaluate as a cause of lithiasis. It is undoubtedly true that many stones develop in a sterile urine. Often it is impossible to be sure whether infection was present before a stone formed, or resulted from stasis as a result of the presence of a calculus. Certain types of infections do definitely increase the likelihood of stone. Organisms that split urea such as Bacillus proteus have been known for a long time to favor stone formation.

Disturbances of body metabolism cause stones to form in the urinary tract. This has been clearly shown in cystin stones from faulty metabolism of sulphur and in the calcium and phosphatic stones so frequently present in patients suffering from a deranged calcium metabolism associated with parathyroid disease. On the other hand, evidence of disturbed metabolism is entirely lacking in the ordinary individual with urinary tract stone.

Stone formation is now the subject of careful study by the internist, chemist and urologist, and, although the problem is far from solved, progress is being made each year as new facts and theories accumulate.

The subject of *renal infarcts* is one which has received comparatively little attention in the literature although it is our impression that it is not a rare condition. Two such cases have been recently observed on the wards at the Massachusetts General Hospital. Frequently an accurate diagnosis is not reached until the kidney is exposed at operation or autopsy, as was true in a recently reported case by Saelhof[5] of infarction of the left kidney with thrombosis of the renal vessels. In this instance the symptoms of acute, severe pain in the renal region were pronounced, a moderate leucocytosis was present, the urine was normal save for a trace of albumin, and intravenous pyelography revealed considerable impairment of the function of the affected kidney. The true condition was recognized at operation when the kidney was removed. This patient recovered but died in three and a half months from thrombosis of the coronary artery and multiple thrombi of the pulmonary vessel and pulmonary infarcts.

The above case is cited as being typical in so many respects of renal infarction. That one vascular accident may rapidly follow another in those patients was evident in a recently studied case at the Massachusetts General Hospital. The patient was a young woman with chronic valvular heart disease who entered the hospital complaining of sudden severe pain in the region of the kidney. Signs and symptoms which were similar to those of the previously mentioned patient were present and this patient died suddenly about three weeks later from probable thrombosis of the vessels supplying the brain stem.

A very good review of this little mentioned subject of renal infarcts was presented by Barney and Mintz[6] who studied the autopsy reports of 143 cases of the condition at the Massachusetts General Hospital. That such cases are usually seen on the Medical Service was evident from the fact that 117 or 83 per cent of these patients were admitted to the medical wards. Almost all of them were suffering from acute or chronic heart disease; many had advanced arteriosclerosis.

Study of this large series of cases brought out certain facts. All ages were represented from a boy of six to a man of seventy-seven, the majority occurring between the ages of thirty and fifty. More than half (68 per cent) of these patients had shown no rise in temperature. Examination of the urine in about one third of these cases failed to reveal any abnormality and in but four had there been gross hematuria. Urinary symptoms for the most part were entirely absent. Nausea and vomiting were symptoms in a small number (8 per cent), and none complained of persistent or excessive diarrhea, although such symptoms were reported as prominent in renal infarction by other observers. It is surprising that over half of these patients (64.7 per cent) gave no history of pain or tenderness at any time, although multiple and large infarcts were found present. The authors conclude that while total infarction of the kidney may be associated with pain and tenderness, patients with extensive infarcts may be entirely free from such symptoms.

The important relationship which cardiac pathology bears to renal infarction was evident from the fact that only six (4.4 per cent) of the 136 cases so studied gave evidence of normal hearts. Most of the patients exhibited lesions of the valves or myocardium of long standing. Endocarditis, therefore, acute or chronic, usually associated with cardiac hypertrophy and dilatation, was considered the most important factor in the production of renal infarcts. The portions of the vascular system (excluding the heart) most often involved were the renal arteries, common and external iliac arteries and veins, femoral vessels, abdominal aorta and inferior vena cava in order of frequency. Other vessels were occasionally occluded, such as the mesenteric or splenic artery, the hepatic artery and the large vessels supplying the extremities.

Infection (presumably blood stream) was demonstrated in about half of these cases and was considered of more frequent occurrence than this since many of them dated back to the years of less reliable bacteriological methods. Streptococci, usually viridans, were cultured in 72.7 per cent and staphylococci in 18.1 per cent.

The prognosis of renal infarction is considered necessarily serious because of the great probability of continued vascular accidents. The lack of complete study of most of these patients by intravenous and retrograde pyelography adds but little information which is helpful in establishing the diagnosis. A more general rec-

ognition of the condition combined with recent methods of study should considerably improve our ability to make the diagnosis of renal infarction.

"If one has an opportunity to observe many cases of chronic Bright's Disease, he will occasionally be surprised to discover that the patient, dying in uraemia as a result of what was supposed to be chronic nephritis of one of the usual types, has in reality, at autopsy, a *bilateral pyelonephritis* with shrunken kidneys and an irregularly dilated pelvis. Or, if one has an opportunity to watch many children through adolescence to middle life, he may remember the rare instance of a child with persistent pyelitis who died, when a young adult, in uraemia."[7]

This simple and well worded paragraph contains the essentials of a condition which is probably often unrecognized and concerning which sufficiently little has been written to emphasize the difference between chronic nephritis and certain long-standing lesions of the kidneys which are infectious in origin, possibly associated with obstruction. This paper by Longcope and Winkenwerder is one which can be read by the internist and urologist with profit. Only a summary of the essential features is given in this review of their description.

Several writers in the past have drawn attention to chronic pyelonephritis with contracted kidney and have considered that certain of the cases of chronic nephritis were due to an ascending infection of the ureters and renal pelvis. Characteristic features were the presence in the urine of only a moderate amount of albumin with many leucocytes and no casts. In most the blood pressure was elevated, but in some it was normal. Cardiac hypertrophy was sometimes present with a retinitis typical of chronic nephritis. The specific gravity of the urine was low. The majority of the patients were young women. In most cases the disease has ended in death from uremia with small contracted kidneys. The peculiar feature of the disease, as given, was a history of recurring infection of the urinary tract with lumbar pain; in the advanced stages elevated blood pressure, hypertrophy of the heart, elevation of the blood nonprotein nitrogen, and death in uremia; large amounts of urine of low specific gravity, which contained small amounts of albumin and leucocytes but *few or no casts* or red blood cells; occasional attacks of fever, with tenderness on palpation of the kidney region and pyelograms that showed narrowing or irregularities of the kidney pelvis with widening of the calyces.

As said, the majority of the patients have been young women. Early symptoms, before uremia, are often slight and vague, such as poor health for many years with repeated febrile illnesses, or the continual presence of albumin or pus in the urine. Most of these individuals are not seen, however, until symptoms of renal failure appear. Headache, nausea and vomiting, anemia, loss of weight, lassitude and dyspnea were the most important symptoms that led them to consult a physician.

Such symptoms drew attention to the urinary findings which were urine in large amounts with a fixed specific gravity at a low level, small amounts of albumin, no casts and many leucocytes; in other words a urine not typical of pure chronic nephritis. Cultures of the urine frequently revealed the presence of the colon bacillus. Cystoscopic examination usually showed a normal bladder with distinctive pyelograms of irregularly deformed kidney pelves, sometimes slightly dilated, with distorted blunted calyces.

Early recognition of this condition, as distinct from the usual chronic nephritis, before the disease has resulted in irreparable destruction of kidney tissue, should be possible through careful examination and scrutiny of available facts. Efforts to assure adequate renal drainage by ureteral dilatation may be of benefit on the theory that there are present narrowings of the ureteral lumen and there is some evidence of this being of some value from the author's experience. Such cases are, perhaps, not rare but are probably seldom dissociated from chronic nephritis.

From a review of 250 cases of *cord bladder* studied at the Mayo Clinic several facts of interest were brought out. The disease affected males much more frequently than females, the ratio being almost 8 to 1. Nearly half of these patients (47.2 per cent) presented themselves for treatment because of urinary tract symptoms; incontinence, chiefly retention and frequency. Such symptoms had often been present for many years so the condition is not necessarily incompatible with a long life. The chief cause of cord bladder in this series of cases was syphilis of the central nervous system (42.4 per cent), and myelodysplasia (developmental defect) of the spinal cord was the next most frequent cause (20.8 per cent). Spina bifida occulta and associated congenital deformities, enuresis in childhood, early onset of symptoms of cord bladder, and loss of other functions of the sacral cord are the characteristic features of myelodysplasia of the spinal cord.

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CASE RECORDS
of the
MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 22051

PRESENTATION OF CASE

A fifty-six year old Italian laborer entered complaining of pain in the midepigastrium on breathing.

For the past two years the patient had been working at night blasting in subways, deep under ground, where there was much dust and dampness. About eight months before admission he caught cold and developed a dry cough. Following this he experienced a pain high up in the midepigastrium which was aggravated by deep breathing. It was not affected by food and had no relation to meals. He began to feel below par and had to stop working. He was able to be up and around most of the time but occasionally spent a few days in bed. He had always perspired a great deal. Recently, however, perspiration had become so marked that he wet the sheets of his bed. His cough had remained nonproductive and not very persistent. There were no hemoptyses. Recently his pain decreased in severity but his night sweats became more frequent. He had lost about five or ten pounds during the past eight months. There was no vomiting or blood in the stools. He had some vague joint pains on the right side at the beginning of his illness.

He was first married thirty years ago. His wife died during childbirth. His second wife was living and well. There were three children living and well.

He arrived in this country from Italy thirty-nine years ago. There was no history of typhoid or rheumatic fever. He did not smoke. He drank wine occasionally.

On physical examination the patient was well developed and well nourished and in no apparent distress. He had an occasional dry cough. There were dental caries and pyorrhea. The heart was slightly enlarged. A_2 was loud. There were no murmurs. The blood pressure was 150/88. Examination of the chest showed diminished breath sounds over the right base with a questionable slight increase in fremitus. The abdominal wall was very thick. One examiner believed that he felt the tip of the spleen.

The temperature was 99°, the pulse 95. The respirations were 20.

Examination of the urine was negative. The blood showed a red cell count of 3,800,000, with a hemoglobin of 80 per cent. The white cell count was 3,800, 69 per cent polymorphonuclears. The smear was not remarkable. The stools were negative. A Hinton test was negative. The nonprotein nitrogen was 30 milligrams per 100 cubic centimeters. A phenolsulphonephthalein test showed 57 per cent excretion in thirty minutes.

An x-ray film of the chest taken in the Out-Patient Department three weeks before admission was reported as follows: "Diaphragm limited in excursion on the right. Just above the right diaphragm is a large sharply defined tumor mass. It is homogeneous in density, obliterating the outline of the ribs. In the lateral view it is seen to lie in the anterior part of the chest. The costophrenic angle on this side is shallow. There is slightly thickened axillary pleura. The upper right and entire left lung fields are clear. The heart is in the midline and the measurements are slightly above normal, especially in the region of the ventricle."

Further x-ray findings upon admission showed no evidence of organic disease in the esophagus, stomach or duodenum. There was no evidence of a diaphragmatic hernia.

An echinococcus complement fixation and skin tests were negative.

One week after admission a bronchoscopic examination was performed under local anesthesia. The Mosher laryngoscope was passed in order to introduce the 7-40 and 5-45 millimeter scopes in turn for a careful inspection of the bronchial tree, in which no pathology was found throughout. The mucosa of the trachea and bronchi was normal throughout and there were no outcroppings, constrictions, secretion, or evidences of displacement of the tracheobronchial tree. Lipiodol was injected into the base of the right lung with the patient sitting up. The films show that the lipiodol entered the middle lobe bronchus and its divisions and the alveolar structure of the lung as there was no obstruction to the flow of the lipiodol from compression by the mass present. No constrictions or dilatations were present in the lower right lobe bronchi posteriorly.

About two weeks after admission he was transferred to the surgical service for exploration of his chest. In preparation he was given an initial pneumothorax, 300 cubic centimeters of air being introduced until the final pressure was minus one to minus three. Four, seven and eleven days later he was given 300 cubic centimeters, 500 cubic centimeters, and 600 cubic centimeters of air respectively. Following the last injection x-ray films demonstrated that the mass above the right diaphragm was not within the lung and that it moved with the dia-

phragm. The diaphragm was limited in excursion. Four weeks after admission the right phrenic nerve was crushed under local anesthesia and three days later an exploratory operation was performed.

Differential Diagnosis

Dr. John W. Cass: The history is that of a fatal illness of eight months' duration in a fifty-six year old Italian laborer. The predominating symptom is midepigastric pain aggravated by deep breathing and not related to gastrointestinal function. Thus, the impression is that the focus for this pain is in the chest.

The patient was finally forced to stop his work, the reason for which we are not given but we conclude that it is because of increasing pain. After leaving his work he began to have profuse night sweats and perspired easily on exertion. There is no mention of chills or fever so that the sweats were probably due to increasing weakness.

He had an unproductive cough which was not persistent, and there was no hemoptysis. We are led to feel that the pathology causing this cough was not in the parenchyma of the lung necessarily.

The pain decreased slightly and the sweating increased, with still no mention of fever. Again we interpret this as evidence of a progressive debilitating disease, probably not an infectious process.

There was a loss of five or ten pounds of weight in eight months which would be very little weight loss for a gastrointestinal malignancy causing the amount of debility that was present, particularly in view of the statement that there was no vomiting, or blood in the stools. With the evidence so far I believe we can rule out gastrointestinal disease at this point.

I can attach no significance to the vague joint pains on the right side that were present at the onset of his illness.

At physical examination it is stated that he was well developed and nourished and in no apparent distress. There was an occasional dry cough but this was evidently not a striking complaint. No pathology was noted in the nasopharynx or on examination of the heart. In the chest there were dullness and diminished breath sounds at the right base, with a question of an increase in fremitus. We now have a positive finding in the chest which leads us to the suspicion that we are dealing primarily with chest pathology. It is important that signs of at least complete bronchial obstruction were not found; and also, it is interesting that one observer is stated to have felt the spleen. There is no mention of the liver. So that we are left with the suspicion of a slightly enlarged spleen and a liver that was normal or decreased in size. The physical examination as given is very sketchy but demonstrates pathology in the base of the right chest.

The laboratory findings state that the urine was negative. The red blood cell count was 3,000,000 with a hemoglobin of 80 per cent. The white cell count was 3,800, with 69 per cent polymorphonuclears and a normal smear. This blood report is rather confusing. We are looking for a secondary anemia and we have a normal hemoglobin with a low white blood count and a normal smear. I should say that the blood picture is not that of pernicious anemia, because of the smear, and that the hemoglobin finding is probably incorrect, and that we really have a secondary anemia. The low white blood count is of particular interest and, although one white count is inconclusive, this finding in the absence of a better explanation suggests liver damage, notably a cirrhosis. Syphilis I believe can be ruled out by the negative Hinton test. The stools are negative, likewise the nonprotein nitrogen and the phenolsulphonephthalein test. At this point I believe we can definitely rule out gastrointestinal and kidney disease and narrow the field down to the liver and the right chest.

There is no mention of a liver function test which, if done, would be of great help in deciding the question of cirrhosis. The complement fixation and skin tests for echinococcus infection were negative and I believe these sufficient to rule out this obscure infection.

X-ray examination of the chest locates a large, sharply defined tumor mass just above the right diaphragm, lying in the anterior part of the chest. This mass obstructs the outline of the ribs and causes limited excursion of the right diaphragm. I am interested in the statement that the mass is above the diaphragm. This finding is difficult to make in a tumor of this location and if the diagnosis which I am leading up to is correct this x-ray finding is incorrect. The remainder of the lung field is clear, with no evidence of fluid or displacement of the mediastinum or evidence of collapse of any of the lung parenchyma. This latter finding would be unusual for a tumor within the lung proper.

On bronchoscopy it is stated that no pathology was found throughout the bronchial tree and that lipiodol entered the right middle lobe and also the posterior portion of the right lower lobe without demonstrating any pathology. No mention is made of the anterior portion of the lower right lobe. However, in view of the evidence at hand I feel that if there was any obstruction to the lipiodol in this location it was due to outside pressure. Furthermore, the mass is in such a location that it would obscure proper interpretation of lipiodol in the anterior portion of the right lower lobe.

The patient was finally given a right pneumothorax and the definite statement is made that the tumor was not within the lung field. The patient was then explored and I am informed that he died shortly afterwards, the cause of death not being a postoperative complication.

Thus, we have a progressive, fatal disease of eight months' duration which is not an infection and which is localized in the base of the right chest and is from the evidence at hand and from the history and symptoms not within the parenchyma of the lung. We are left then with a tumor first of the liver, undoubtedly malignant as it killed the patient in eight months, and by its size, clinical history and absence of demonstrable focus suggests a primary tumor of the liver. The hint of cirrhosis is a bit more evidence for a primary liver neoplasm; secondly, a tumor of the diaphragm, chest wall or pleura. A leiomyosarcoma of the diaphragm is possible but I would expect, if this tumor was a malignant tumor of the pleura or chest wall, that we would have fluid in the chest, considerably more pain than this patient had, and evidence of extension into the parenchyma of the lung. My diagnosis is primary cancer of the liver.

Preoperative Diagnosis

Tumor of the diaphragm.

Dr. John W. Cass's Diagnosis

Primary cancer of the liver.

Pathologic Diagnosis

Primary cancer of the liver, hepatoma.

Pathologic Discussion

Dr. Tracy B. Mallory: The patient was explored by Dr. Churchill through the thorax under positive intratracheal anesthesia. It became immediately apparent that the tumor lay entirely beneath the diaphragm. The diaphragm was then incised and a large tumor was exposed which evidently arose from the dome of the liver. The liver itself around the tumor was rough and nodular, evidently cirrhotic. The tumor was extremely soft and vascular and ruptured spontaneously when the protective layer of the diaphragm was freed from it. A small piece was taken for biopsy. The hemorrhage was controlled with some difficulty by suturing the diaphragm back to the tumor once more. Dr. Churchill's postoperative diagnosis was primary carcinoma of the liver arising in a cirrhotic liver.

The biopsy specimen showed cells similar to liver cells in appearance, but rapidly growing, atypical and evidently neoplastic. Here and there they surrounded small canaliculi in which were masses of inspissated bile—in other words a typical hepatoma.

I think Dr. Cass's inferential reasoning in reaching his diagnosis deserves a great deal of credit. Primary cancer of the liver in this climate occurs only in individuals with an underlying long-standing cirrhosis. In order to make the diagnosis, therefore, one should establish the diagnosis of cirrhosis as well as of malignancy. In this case the most definite evidence was the leukopenia—though in my opinion that indicates splenic congestion rather than hepatic insufficiency. In retrospect two other points can be brought into line. The spleen was apparently felt—a very rare finding in metastatic disease of the liver—and the blood picture was on the whole that of a macrocytic anemia—a characteristic finding in cirrhosis as we have learned in the last few years.

I think it is only fair to point out, and in doing so I do not wish to detract from Dr. Cass's brilliant diagnosis, that this case is an old one and in intervening years we have seen two other cases of primary carcinoma of the liver which elevated the diaphragm in an exactly similar fashion. At the time when Dr. Churchill operated on this patient none of us had seen a case exactly like this. Six days after operation the patient began to pass bloody stools and on several occasions vomited small amounts of bright red blood. This was interpreted as bleeding from esophageal varices secondary to the cirrhosis. He failed rapidly in spite of a transfusion and died eight days after the operation.

CASE 22052

Presentation of Case

A fifty year old white single American woman was admitted complaining of blisters on her skin.

About three weeks before entry the patient first noticed itchy reddish blotches on her thighs. These resembled mosquito bites. Other than the associated pruritus the patient felt quite well. Shortly afterwards, however, these lesions spread up over the buttocks and lumbar region and down the thighs. About one week after the onset several blotches appeared on her wrist and later became raised and blister-like in appearance. The blebs ruptured spontaneously and discharged slightly milky fluid. The areas were denuded and did not heal although the raw surfaces were dried somewhat by the application of salve. During the succeeding ten days the remainder of the body, the ankles, calves and, more prominently, the entire back became involved with bullous lesions. On the abdomen there was only an irregular,

blotchy, reddish, maculopapular eruption. The lips, mouth, and conjunctival sacs became affected later. The mouth seemed to be filled with canker sores, and many blisters appeared within her nostrils. For two or three days prior to entry her eyes became bloodshot, sore, and exhibited marked epiphora.

An appendectomy for acute appendicitis was done twenty-five years before entry. Her menopause occurred four years prior to admission.

One year ago there appeared in the left supraclavicular region a mass about the size of an egg which disappeared after x-ray treatment. About four months prior to the onset of her current illness she noticed that her abdomen was swelling progressively and that she became somewhat short of breath. An operation for ovarian cyst was advised and shortly afterward a laparotomy was performed. The surgeon found a large amount of chylous fluid in the peritoneal cavity. A small cyst of the left ovary was found but nothing was removed. The patient convalesced rapidly. Thereafter, however, she began to lose some weight, but the abdomen again became swollen and compensated for the weight loss. Six weeks before entry about ten quarts of milky fluid was removed by abdominal paracentesis. Some slight swelling of the ankles appeared about this time.

Physical examination showed a thin emaciated woman who appeared to be quite ill. The skin over the neck, arms, back, legs, and chest exhibited a vesicular, erythematous, desquamative eruption. The skin over the back showed peeling of the dermis and several bullae and vesicles. Many areas were eroded, wet, and oozed serosanguineous material. The mucous membranes of the nose and mouth were covered with many shallow ulcers. There was slight ectropion with diffuse injection and several small vesicles were observed within the conjunctival sac. A few firm, small, discrete nodes were felt in the cervical, axillary and epitrochlear regions. The heart was slightly enlarged and a systolic murmur was heard best at the apex. The abdomen was full and rounded. Both shifting dullness and a fluid wave were elicited. The liver and spleen were not felt. There was pitting edema of both lower extremities.

The temperature was 101°, the pulse 78. The respirations were 20.

Examination of the urine showed a specific gravity of 1.020 and a slight trace of albumin. The sediment was negative. The blood showed a red cell count of 4,500,000, with a hemoglobin of 80 per cent. The white cell count was 9,200, 77 per cent polymorphonuclears, 12 lymphocytes, 4 monocytes, 4 eosinophils, and 3 myelocytes.

On the second day the patient developed considerable dyspnea. Examination elicited the presence of many râles in the right chest. On the following day the dyspnea was more pronounced. The respirations rose to 44. The temperature was 102° and the pulse 120. There was flatness over the entire right chest with lessened tactile fremitus, distant tubular breathing and egophony. The heart appeared to be displaced to the left, upon which side Grocco's sign was elicited. About twenty ounces of yellowish milky fluid was removed by thoracentesis. Three days later ten ounces of similar fluid was again removed. There was little relief of symptoms. She died on the sixth hospital day.

Differential Diagnosis

Dr. Perry C. Baird: The bullous eruption in this case probably represents either pemphigus or erythema multiforme. The evidence, in my opinion, points fairly conclusively to pemphigus.

Both pemphigus and erythema multiforme are diseases which may be superimposed more or less secondarily upon a background of systemic disease of many different types. Such a background is usually infectious in nature but may be carcinoma among other things and, on general principles, there is no reason why it could not be Hodgkin's disease as in this case.

There is no history of drug ingestion but this should have been inquired into closely in consideration of either diagnosis. Arsenic and iodides as well as many other drugs will produce a bullous type of dermatitis medicamentosa closely simulating pemphigus and erythema multiforme.

There are several diagnoses which should be mentioned but which are easily excluded—these include: bullous leprosy, bullous syphiloderm, bullous impetigo, bullous dermatitis herpetiformis.

The onset with itchy reddish blotches resembling mosquito bites suggests an urticarial type of lesion and is in favor of erythema multiforme.

The description of irregular, blotchy, reddish maculopapular lesions on the abdomen also suggests erythema multiforme. All of these lesions, however, are consistent with what may occasionally be found in association with Hodgkin's disease, which I presume is present in this case.

A history of injury or animal bite would have been helpful in diagnosing pemphigus but is not at all essential. The absence of this history does not exclude pemphigus.

The history and physical examination in all other respects are strongly in favor of pemphigus.

The generalized distribution with special mention of buttocks, thighs, wrists, ankles, calves and back is a common distribution in pemphigus.

Spontaneous rupture of bullae leaving de-

nuded areas failing to heal and a serosanguineous exudate are characteristic of pemphigus.

Involvement of the lips, mouth, nostrils and conjunctival sacs is very common in pemphigus. In a series of cases reported by Pernet and Bullock, all showed involvement of the mouth, nostrils and conjunctival sacs. Erythema multiforme involves these areas rarely or occasionally, much less frequently than pemphigus.

Adenopathy of the cervical, axillary and epitrochlear regions should raise, among other things, the question of syphilis. The bullous syphiloderm, however, is seen only in infants with hereditary lues and is confined usually to the palms and soles. The albuminuria and fever present in the case are common findings in pemphigus.

The fatal issue is strongly in favor of pemphigus but may occur rarely in erythema multiforme.

A Pels-Macht test would have been interesting though I do not think that the differential is to be regarded as difficult enough to warrant it.

The diagnosis of either pemphigus or erythema multiforme does not help us in surmising what may have caused the accumulation of a chylous fluid in the peritoneal and right pleural cavities. The history of an egg-sized mass in the left supraclavicular region disappearing on x-ray treatment suggests lymphoblastoma and I presume that Hodgkin's disease involving the mediastinal glands could lead to obstruction of the thoracic duct with consequent collection of a chylous fluid in the peritoneal cavities.

One case of chylothorax due to lymphosarcoma reported by Irons showed disappearance of fluid following deep x-ray therapy. The results of such therapy would have been helpful in this case.

Skin lesions with severe itching, pigmentation, ulcers, and small granulomata, urticaria, and erythematous nodules, have been described in Hodgkin's disease and suggest a possible linkage in this case between the skin lesions and probable underlying systemic disease. I am unaware, however, that lymphoblastoma of the skin could give rise to a bullous reaction.

My diagnoses are pemphigus and Hodgkin's disease.

DR. MYER M. TOLMAN: Every now and then we see a case of pemphigus, usually with an onset similar to that which this patient showed, with symptoms of an underlying Hodgkin's or lymphoblastoma. We made that diagnosis in this case. It appears that these manifestations are pemphigoid lesions and not true pemphigus as such. We know that Hodgkin's disease and lymphoblastomas in general can in the end stages cause an eruption not unlike either erythema multiforme or pemphigus of the toxic type. A Pels-Macht test was done but it went astray. I do not think it would make much difference either way because a toxic eruption such as this case presented would give the same amount of toxicity by the test that pemphigus would. It was our impression that this woman had Hodgkin's disease and died of it, and that the pemphigoid lesions were a manifestation of the disease rather than a true pemphigus in a case of Hodgkin's disease.

CLINICAL DIAGNOSES

Hodgkin's disease.
Pemphigus.

DR. PERRY C. BAIRD'S DIAGNOSES

Hodgkin's disease.
Pemphigus.

ANATOMIC DIAGNOSES

Pemphigus.
Lymphoblastoma, sarcomatous type, retroperitoneal, mesenteric and axillary.
Peritonitis, acute and chronic, generalized.
Pleuritis, acute fibrinous, right.
Hemohydrothorax, left.
Pyothorax, right.
Pulmonary congestion, bilateral.
Pulmonary atelectasis, right.
Pleuritis, chronic fibrous, left apical.
Paralytic ileus.
Ovarian cyst, left.
Fatty vacuolization of liver.
Leiomyoma, broad ligament, right.
Hydronephrosis, left.
Hydroureter, left.
Thyroid cyst, right lower lobe.
Operative scar: Exploratory laparotomy.

PATHOLOGIC DISCUSSION

DR. TRACY B. MALLORY: We take up dermatological cases here all too rarely for two reasons. One is that it always seems to me very unfair to ask the dermatologist to try to make a diagnosis from a purely verbal description of the lesion. I find it so utterly impossible myself to describe these lesions in a way that makes one sound at all different from another that it seems to me nearly impossible to put in words differences that would be quite obvious to the eye and palpation. The other reason for not taking up these cases more often than we do is that the pathology department knows nothing about them, and few of them have pathognomonic histologic pictures so that we are not able to check the diagnosis and generally take the dermatologist's word for them.

This patient had a lesion that so far as I know is perfectly consistent with pemphigus. I certainly cannot say it was not, and I think Dr. Baird's view that the pemphigus was essentiallly a terminal manifestation seems entirely reasonable. She did have extensive lym-

phomatous involvement, chiefly limited to the mesenteric and retroperitoneal lymph nodes. It is true there were small glands peripherally but the significantly large ones found at autopsy were all within the peritoneal cavity. The liver and spleen were not involved. The bone marrow was not infiltrated.

Microscopically the nodes show complete obliteration of the architecture and diffuse infiltration by fairly mature lymphocytes, a picture usually termed lymphosarcoma. The final immediate terminal episode was the development of a generalized peritonitis for which a local source was not found, apparently a terminal infection of the ascitic fluid.

DR. BAIRD: Did you find the level at which the thoracic duct was obstructed?

DR. MALLORY: An effort was made but we could not trace it out.

DR. BAIRD: Possibly a very small node in the mediastinum had obstructed it.

DR. MALLORY: It is perfectly possible. That is particularly likely here because throughout the nodes there was a great deal of fibrosis, rather peculiar hyalin fibrosis that I have seen two or three times before in lymph nodes undergoing spontaneous contraction in lymphosarcoma.

The New England
Journal of Medicine

SUCCESSOR TO
THE BOSTON MEDICAL AND SURGICAL JOURNAL
Established in 1828

Published by THE MASSACHUSETTS MEDICAL SOCIETY under the jurisdiction of the

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Material for early publication should be received not later than noon on Saturday. Orders for reprints must be sent to the Journal office, 8 Fenway.

The Journal does not hold itself responsible for statements made by any contributor.

Communications should be addressed to The New England Journal of Medicine, 8 Fenway, Boston, Mass.

BACTERIA-FREE VACCINE VIRUS

THE production of vaccine virus which contains no bacteria has been the dream, for many years, of those concerned with its manufacture. The pulp obtained from the calf always contains some bacteria. Attempts to free the virus of these bacteria and, at the same time, maintain the potency of the virus have been unsuccessful. Several procedures have been devised in which the bacteria can be diminished. In fact, the interstate shipment of vaccine virus containing more than fifty bacteria per dose or containing pathogenic bacteria, as determined by animal tests, is prohibited by the U. S. Public Health Service.

Noguchi[1] was the first to obtain a bacteria-free virus, which he propagated in the testicles of bulls or rabbits. This gave typical reactions in human beings, but the virus lost its potency rapidly and the method was not practical for propagation on a large scale. The same held true for a neurovaccine, prepared by Levaditi[2], from the brains of rabbits.

More recent experimentation has shown that the bacteria-free testicular virus can be propagated in the living tissue of the chick embryo, either *in vivo* according to the method of Goodpasture[3] or *in vitro* by the method of Rivers[4]. In the former, the virus-containing material is placed on the chorio-allantoic membrane of an intact embryo, fourteen days old. In the latter, the testicular virus is transferred to tissue cultures composed of minced chick embryo tissue and Tyrode's solution. Multiplication of the virus occurs in each instance and the possibility of adapting one or the other method to the manufacture of virus for large scale Jennerian prophylaxis is apparent.

Results following dermal vaccination with the chick virus grown *in vivo* have been reported by Goodpasture and Buddingh[5]. In a fairly small experimental group the chick vaccine behaved the same as calf vaccine and the immunity conferred, as measured by revaccination and by titrating the antiviral content of the sera before and after vaccination, was identical. In over 1000 field vaccinations with a virus obtained from the 100th generation of the *in vivo* culture, there were 93.6 per cent positive reactions among the primary vaccinations. The potency is reported to be easily maintained and to be uniform. A pustular lesion occurs in the typical positive primary reaction, but the impression was gained that the clinical course was milder. There were no complications or sequelae.

Rivers[6] has recently reported a very small series of primary vaccinations and revaccinations in which the bacteria-free virus prepared *in vitro* has been injected intradermally. The advantages of this procedure are several. The injection is quickly and easily performed and the amount of material injected can be accurately controlled. No open lesion results, so that no dressing is required, and the possible danger of secondary infection is avoided. His revaccinations, both by intradermal injections following primary vaccinations with calf pulp and by dermal vaccinations with calf pulp following primary intradermal injections, were judged to indicate that the culture virus is an effective immunizing agent; but, they were performed so soon after the primary vaccination that they are not particularly significant. Some difficulty has been experienced in preserving the potency.

It is to be hoped that eventually a bacteria-free virus will be available for routine prophylaxis. The work mentioned above is most encouraging; but, none of the vaccinated people have been actually exposed to smallpox and the series is too small to judge the influence of these culture viruses on the incidence of post-vaccinal encephalitis. As with other new methods of therapy, which offer improvements over existing successful methods, one should wait until their effectiveness is proved beyond reasonable doubt. This is particularly true of pro-

cedures, such as Jennerian prophylaxis, which are so important from the point of view of public health. One must admit that the mass protection safely conferred by dermal vaccination with the calf pulp manufactured and distributed by the Massachusetts Department of Public Health is as near perfect as is biologically possible!

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INDEPENDENCE AND FREEDOM

It is in the American tradition to seek independence and liberty and the mere cry that by any movement in society freedom is threatened, is sure to attract attention and arouse sympathy. Thus, a part of the stock argument of the nonapproved medical schools is that they are the upholders of the American tradition and that they are persecuted for their independent views.

This claim deserves scrutiny. Of what are they independent and for what do they seek freedom? Freedom is not an end in itself: freedom for action is what is really sought. What is it they desire to do? What are they actually doing?

The independence they seek is independence of all supervision. Control can be exercised formally by some legally constituted authority, or informally by public opinion. Formal control can be avoided under certain conditions. Informal control is inescapable if public opinion is enlightened.

This is realized by these schools and thus every effort is made to cover up and hide what they are doing. Exactly what they are doing outsiders do not know, but a fair general estimate can be made on the basis of what has been found in some schools in the past and the probable reactions of human nature under certain conditions. Since they strive so valiantly to prevent investigation, undoubtedly they have something which it is to their advantage to cover up and to their disadvantage to disclose. One's curiosity is stimulated.

It was reported some months ago that the resurvey of medical schools in the United States and Canada might include all schools, as osteopathic and nonapproved medical schools were to be invited to participate. It is now reported that certain of the nonapproved schools have refused to pay any attention to the letters of invitation, not even acknowledging their receipt.

The history of the investigation of medical education in Massachusetts, proposed during the 1935 session of the General Court is interesting. Opposition was expressed by representatives of the nonapproved schools on the ground that the Commission would be packed against them, that in the nature of the case, the Commission would be prejudiced. It was a gratuitous insult to the duly constituted governmental authorities. The composition of what they would consider an "unprejudiced" commission would be an interesting subject for study. Doubtless they would agree with the old lady who, watching the soldiers march by, observed that they were all out of step except her son John.

Independence and freedom without qualification cannot exist. They must be restricted, in the interest of other individuals, usually in groups manifesting social control. Educational institutions such as medical schools are quasi-public institutions.

The independence and freedom in medical education claimed by nonapproved schools would entitle them to give a medical education satisfactory to themselves. It would not entitle them, as they claim, to forbid the satisfaction of the state and to force upon the state uneducated physicians. In the protection of the public against unqualified practitioners, the state may properly, and as things are now, should insist that all physicians receive a reasonably good medical education before being admitted to examination for license to practice.

In so far as the graduates of medical schools are to be candidates for licensure to practice medicine, to this extent the independence and freedom of all medical schools to do as they please should be restricted, for the protection of the public, if it pleases these schools to degrade medical education.

THE CONQUEST OF PESTILENCE

The septic appearance of death rate graphs of almost the entire nineteenth century was due to pestilence. By comparison the influenza epidemic of 1918, raising the deaths in New York City from approximately 14.5 per thousand to about 18 per thousand of population looks like a minor flareup of temperature during the defervescence of an acute and stormy infectious illness. The story of the conquest of pestilence is told by Dr. Charles F. Bolduan, director of Health Education in the New York City Department of Health, in *The Milbank Memorial Fund Quarterly* for July, 1935.

In 1798, yellow fever showed 1,500 deaths in a population of approximately 60,000, and in that same epidemic sixteen of the forty practicing physicians fell victims to the disease. Yellow fever reappeared repeatedly, there being 200

cases recorded as late as 1870. Smallpox was present almost constantly, causing 1,666 deaths in 1872, over 500 in 1881, and 132 as late as 1891. The other contagious diseases also played their parts, measles being responsible for 443 deaths in 1836-37 and 1,032 in 1891. Scarlet fever accounted for 579 fatalities in 1836-37 and diphtheria for 4,509 in 1887.

The real panics, however, were caused by the various epidemics of cholera, following those in Europe, and during them the prevailing death rate was approximately doubled, jumping during one epidemic from 25 to 50 per thousand of population. In 1832, with a population of slightly over 200,000 the city experienced 3,513 deaths from cholera; in 1849, with a population of 515,000, 5,071 deaths, and in 1854, 2,509 deaths, smallpox causing 611 in the same year. By comparison the influenza in 1918, causing 12,562 deaths in a population of over five and a half million pales into comparative insignificance. The average death rate of something over 25 per thousand until 1890, sometimes doubled, has fallen steadily during the last forty odd years to 10.2 per thousand in 1933.

As Dr. Bolduan states, such a calamity as a doubling of the death rate in the present state of medical knowledge and application is so remote as to be almost unthinkable. Other causes of death, however, have been assuming even greater importance. Tuberculosis and syphilis, both preventable diseases, still rank among the major causes of death. Our efforts must be directed toward diseases of the cardio-arterio-renal system, cancer and diabetes, appendicitis and automobile accidents, and something must be done to reduce maternal mortality and the deaths of infants during the first month of life.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

LADD, WILLIAM E. A.B., M.D. Harvard University Medical School 1906. F.A.C.S. Clinical Professor of Surgery, Harvard University Medical School. Chief of Surgical Service, Children's Hospital, Boston. His subject is "Congenital Absence of the Pericardium with Report of a Case." Page 183. Address: 66 Commonwealth Avenue, Boston.

CASS, JOHN W., JR. Ph.B., M.D. Yale University School of Medicine 1929. Assistant in Medicine, Massachusetts General Hospital. Assistant Medical Adviser, Department of Hygiene, Harvard University Medical School. Staff, New England Deaconess Hospital; Channing Home, and Robert Breck Brigham Hospital. His subject is "The Question of 'Influenza' and Atypical Pneumonia." Page 187. Address: 205 Beacon Street, Boston.

SUBBAROW, Y. M.B., Ph.D. Harvard University, 1930. Austin Teaching Fellow, Harvard University. Address: Biochemical Laboratory, Harvard University Medical School, Boston. Associated with him are

JACOBSON, BERNARD M. M.D. Harvard University Medical School 1929. Instructor in Medicine, Harvard University Medical School. Research Fellow in Medicine, Massachusetts General Hospital. Address: Massachusetts General Hospital, Boston. And

FISKE, CYRUS H. M.D. Harvard University Medical School 1914. Professor of Biological Chemistry, Harvard University Medical School. Address: Biochemical Laboratory, Harvard University Medical School, Boston. Their subject is "A Partially Purified Liver Extract Therapeutically Effective in Pernicious Anemia." Page 194.

GORDON, BURGESS. A.B., M.D. Jefferson Medical College of Philadelphia 1919. Director of the Department for Diseases of the Chest, Jefferson Hospital. Associate Professor of Medicine, Jefferson Medical College. His subject is "The Mechanism and Effects of Abdominal Compression in the Treatment of Pulmonary Tuberculosis." Page 195. Address: 1832 Spruce Street, Philadelphia, Pa.

SCHNITKER, MAURICE A. B.S., M.D. University of Michigan Medical School 1931. Assistant Resident Physician, Peter Bent Brigham Hospital. Address: Peter Bent Brigham Hospital, Boston. Associated with him is

EVANS, WILLIAM A., JR. A.B., M.D. Johns Hopkins University School of Medicine, Baltimore, 1930. Assistant Resident Physician, Peter Bent Brigham Hospital. Address: Peter Bent Brigham Hospital, Boston. Their subject is "Peptic Ulcer." Page 198.

MARSHALL, GEORGE G. M.D. University of Vermont College of Medicine 1893. F.A.C.S. His subject is "Dermoid Teeth in the External Auditory Canal, with Comments on Teratomas and Dermoids in General." Page 202. Address: Rutland, Vt.

COLBY, FLETCHER H. B.S., M.D. Harvard University Medical School 1918. F.A.C.S. Assistant Visiting Urologist, Massachusetts General Hospital. Assistant in Surgery, Harvard University Medical School. Assistant Urologist, Palmer Memorial and Huntington Memorial Hospitals. Urologist Consultant, Lakeville State Sanatorium. Junior Associate in Urology, Peter Bent Brigham Hospital. His subject is "Progress in Urology, 1934." Page 205. Address: 205 Beacon Street, Boston.

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Mercy Hospital—Dr. George B. Corcoran
Wesson Memorial Hospital—Dr. Frederic Hagler.

MASSACHUSETTS LEGISLATIVE NOTES

The Committee on State and National Legislation of the Massachusetts Medical Society has voted to:

SUPPORT

Senate 321. Resolve—Directing the Department of Public Health to investigate the feasibility, necessity and cost of a new hospital for the treatment of infantile paralysis and arthritis.

The title is self-explanatory, the results to be reported to the General Court with their recommendations, by June 1, 1936.

Petition of Charles T. Daly.

Given to Public Health. Hearing Thursday, February 6, 10:30 A.M., Room 450, State House, Boston.

House 34. An Act relative to the qualifications of applicants for registration as qualified physicians.

Introduced by the Board of Registration in Medicine.

This bill prescribes certain higher standards than are now required for applicants as practitioners. New requirements are two years of college and both college and medical school must be approved.

FAVOR

House 59. An Act defining stillbirths.

This Act amends the present laws with an exact definition of stillbirths.

Introduced by the Secretary of the Commonwealth.

Given to Public Health. Hearing Thursday, February 6, 10:30 A.M., Room 450, State House, Boston.

TO OPPOSE THE FOLLOWING BILLS

Senate 20. An Act providing for the construction and maintenance of a hospital for the care and treatment of victims of infantile paralysis.

This authorizes the state to build and maintain a hospital specializing in the treatment of infantile paralysis in the metropolitan district.

Introduced by Senator Madden.

Given to Public Health. Hearing Thursday, February 6, 10:30 A.M., Room 450, State House, Boston.

Senate 24. Bill abolishing the several boards of trustees of certain state institutions and transferring their functions to the Governor and Council.

This gives to the Governor and Council all the powers formerly given to the boards of all institutions in the Department of Mental Diseases and Public Welfare.

Introduced by Senator Joseph A. Langone, Jr.

Senate 51. Bill establishing and maintaining at North Reading State Sanatorium a division for the care and treatment of persons suffering from cancer.

This simply authorizes the establishment at North Reading of a cancer hospital, as is now being conducted at Pondville.

Petition of Senator Charles T. Daly.

Given to Public Health. Hearing Thursday, February 6, 10:30 A.M., Room 450, State House, Boston.

Senate 322. An Act to provide for the construction and maintenance of a health center for the care and treatment of persons suffering from infantile paralysis.

This bill authorizes the establishment of a health center for infantile paralysis, preferably on Buzzards Bay. The center shall be equipped for treatment, recreation, etc., and shall help out those needing financial aid.

Petition of Senator Frank Hurley.

Referred to Public Health. Hearing Thursday, February 6, 10:30 A.M., Room 450, State House, Boston.

Senate 323. An Act relative to the practice of optometry.

This Act amends the present law and defines who may practice optometry in this state. It makes physicians and surgeons subject to the rules of the Board of Optometry. It also states the methods by which, and the reasons for which, a person can have his license revoked.

Introduced by Massachusetts Society of Optometrists.

Senate 388. An Act providing for representation on the Board of Registration in Medicine of the several medical schools of the Commonwealth authorized to grant the degree of doctor of medicine.

This provides that of the seven members of the Board of Registration there shall be one representing Harvard Medical School, one Boston University School of Medicine, one Tufts College Medical

School, one Middlesex College of Medicine and Surgery, one College of Physicians and Surgeons of Boston, one Massachusetts College of Osteopathy and the seventh not designated.

Introduced by Paul J. Campbell.

Given to State Administration. Hearing Monday, March 2, 10:00 A.M., Room 423, State House, Boston.

House 574. An Act to require hospitals receiving public support, to accord equal rights of admission to patients of all duly registered physicians.

It states, moreover, that all the hospital facilities shall be open to every registered physician.

Introduced by Charles F. Wakeling.

Given to Public Health. Hearing Thursday, February 6, 10:30 A.M., Room 450, State House, Boston.

House 662. Bill providing for the regulation of the practice of physicians and surgeons in certain cases.

This provides that no physician may remove a patient's limb or organ without the consent of said patient (if sane) or of patient's nearest relative. Any organ removed to be saved to show whether said operation was necessary.

Petition of Annie D. Brown.

Referred to Public Health. Hearing Thursday, February 6, 10:30 A.M., Room 450, State House, Boston.

House 949. An Act to defend our inalienable, Constitutional rights to the freedom and security of our person against compulsory vaccination or inoculation.

This provides that nobody need be vaccinated without his consent or, in the case of minors, without the written consent of their guardians. Vaccination shall not be made a requisite for admission to public schools.

Petition by Citizens' Committee Opposing Compulsory Vaccination.

Referred to Public Health.

House 1444. An Act relative to the establishment of a board of examination and registration to regulate the practice of chiropractic.

Introduced by James E. Ward.

Referred to Public Health.

House 1458. A petition for legislation to create a board of examination and registration to regulate the practice of magnetic healers.

Introduced by Arsene Pare.

Referred to State Administration. Hearing Monday, March 2, 10:00 A.M., Room 423, State House, Boston.

NO DECISION (REFERRED TO COUNCIL)

House 35. An Act for the annual registration of physicians and the publication of a list of registered physicians.

This bill provides that for an annual fee of two dollars, the physicians shall be registered annually, and said list shall be published. This bill is designed to eliminate unlicensed practitioners.

Introduced by Board of Registration in Medicine.

Given to Public Health. Hearing Thursday, February 6, 10:30 A.M., Room 450, State House, Boston.

MISCELLANY

SPECIFIC TREATMENT FOR LOBAR PNEUMONIA

Lobar pneumonia is the seventh leading cause of death in Massachusetts. Type I or Type II pneumococci are the cause of the disease in over one-half of the cases.

The case fatality rate of Type I pneumococcus pneumonia untreated with serum is approximately 25 per cent and of Type II, 41 per cent. The expected death rate in these two types can be much reduced by early specific treatment. Of 504 Type I cases in the Massachusetts Pneumonia Study, which were treated with serum within the first four days of the illness, only 56 or 11.1 per cent died. Of 136 Type II cases similarly treated, 37 or 27.2 per cent died. This experience in Massachusetts has demonstrated that specific treatment can be successfully used by physicians in general practice.

Success in specific treatment depends for the most part upon the early use of serum. Thus the type of pneumococcus infection should be determined at the earliest possible moment. The importance of the time element is emphasized by the experience in Massachusetts. Of 377 Type I cases treated during the first three days, 32 died (8.5 per cent) and of 127 treated on the fourth day, 24 died (18.9 per cent).

DETERMINATION OF TYPE OF PNEUMOCOCCUS INFECTION

The type of infection is more readily determined by examination of the sputum than by other means. The specimen should come from the lung with as little admixture of saliva as possible. It is desirable to obtain at least a teaspoonful of sputum, which is collected in a clean wide-mouthed bottle or cardboard sputum box, and to send it at once, preferably by messenger, to the nearest laboratory equipped for typing. Special containers are available through local Boards of Health. *No antiseptic* should be added to the sputum. Tuberculosis sputum outfits should not be used as they contain carbolic acid.

The Neufeld method of typing is rapid, simple and reliable and has supplanted other methods. It is applicable to pneumococci from any source and usually permits identification of type within a few minutes.

Typing will be done without charge at the State Bacteriological Laboratory, Room 527, State House, Boston. In case of emergency, typing of sputum from patients for whom serum therapy is applicable will be done during the night, week-ends, or on holidays. Such specimens should be left with the State House Guard. All sputums showing Type I or Type II pneumococci are reported by telephone or telegraph, prepaid.

In addition to the State House Laboratory, typing facilities are also available elsewhere. The charges

for the typing depend on the laboratory. Typing in Boston is done at the following hospitals: Boston City, Faulkner, Evans Department of the Massachusetts Memorial, and the New England Deaconess.

Elsewhere in the State facilities have been established for pneumococcus typing in 57 laboratories, i.e.:

Attleboro, Sturdy Memorial Hospital
Ayer, Ayer Community Memorial Hospital
Beverly, Beverly Hospital
Brockton, Brockton Hospital
Cambridge, Cambridge Hospital
Cambridge, Cambridge City Hospital
Chelsea, Chelsea Memorial Hospital
Clinton, Clinton Hospital
Everett, Whidden Memorial Hospital
Fall River, Fall River General Hospital
Fall River, St. Ann's Hospital
Fall River, Truesdale Hospital
Fall River, Union Hospital
Fitchburg, Burbank Hospital
Framingham, Framingham Union Hospital
Gardner, Henry Heywood Memorial Hospital
Gloucester, Addison Gilbert Hospital
Great Barrington, Fairview Hospital
Greenfield, Franklin County Hospital
Haverhill, Gale Hospital
Holyoke, Holyoke Hospital
Holyoke, Providence Hospital
Hyannis, Cape Cod Hospital
Lawrence, Lawrence General Hospital
Leominster, Leominster Hospital
Lowell, Lowell General Hospital
Lowell, St. John's Hospital
Lowell, St. Joseph's Hospital
Lynn, Lynn Hospital
Malden, Malden Hospital
Marlboro, Marlboro Hospital
Milford, Milford Hospital
Natick, Leonard Morse Hospital
New Bedford, St. Luke's Hospital
Newburyport, Anna Jaques Hospital
Newton, Newton Hospital
North Adams, North Adams Hospital
Northampton, Cooley Dickinson Hospital
Norwood, Norwood Hospital
Palmer, Wing Memorial Hospital
Peabody, J. B. Thomas Hospital
Pittsfield, House of Mercy Hospital
Pittsfield, St. Luke's Hospital
Plymouth, Jordan Hospital
Pocasset, Barnstable County Sanatorium
Quincy, Quincy City Hospital
Salem, Salem Hospital
Southbridge, Harrington Memorial Hospital
Springfield, Springfield Hospital
Springfield, Mercy Hospital
Springfield, Wesson Hospital
Taunton, Morton Hospital
Westfield, Noble Hospital
Worcester, St. Vincent's Hospital
Worcester, Worcester City Hospital
Worcester, Worcester Hahnemann Hospital
Worcester, Worcester Memorial Hospital.

SPECIFIC SERUM FOR TREATMENT

Specific serum for the treatment of Type I or II pneumococcus pneumonia is available to physicians through the State Laboratory, Room 527, State House, Boston, or through the laboratories of any of the hospitals listed above, provided that:

(1) Sputum or other material from the patient is first typed and found to contain Type I or II pneumococci.

(2) The physician certifies that the patient has not been ill longer than four days (96 hours).

(3) As soon as the patient is discharged, the physician agrees to make a report to the Massachusetts Department of Public Health on a form enclosed with the serum.

Under these conditions 60,000 units of concentrated serum (Felton's antibody solution) will be issued for each Type I pneumonia and 100,000 units for each Type II case.

Bacteriemia occurs in about one-quarter of the cases with Type I and one-third of those with Type II pneumococcus pneumonia and is a very serious condition. This information in relation to bacteriemia is of great importance in treatment. It is desirable to make a blood culture in each case before the first dose of serum is given. If the first blood culture is positive, or, if negative, and the progress of the case is unsatisfactory, it is desirable to continue to take blood cultures at intervals of about twenty-four hours. Blood cultures may be sent for examination to the State Bacteriological Laboratory.

Experience has shown that some cases require more serum than others. An additional 60,000 units of serum may be obtained from any of the above-mentioned laboratories if any of the following conditions are present:

(1) The patient has a bacteriemia as shown by finding Type I or II pneumococci in cultures of his blood.

(2) The patient is pregnant or has been delivered within seven days of the onset of pneumonia.

(3) If the temperature does not drop below 101° F. by mouth within 18 hours of beginning serum treatment; or, if having dropped, it again rises above this level within 48 hours.

Further information concerning the administration of serum will be found in the circular accompanying the serum. The directions given in the circular should be followed in detail.

NURSING SERVICE FOR PNEUMONIA

Clinical experience has shown that patients receiving prompt medical and nursing care have the best chances of recovery. In almost every part of

the State nursing service on a visit basis is available through the visiting nursing associations for patients not needing or who cannot afford a special nurse. In Boston the Community Health Association will give nursing care on a visit basis on the order of a physician. This Association will be glad to coöperate with physicians by sending a specimen of sputum for typing.

PNEUMONIA COMMITTEE, BOSTON HEALTH LEAGUE,
DR. FREDERICK T. LORD, *Chairman*,
DR. FRANK CRUICKSHANK,
DR. WILSON G. SMILLIE,
DR. DWIGHT O'HARA,
DR. RODERICK HEFFRON,
MISS FLORENCE M. PATTERSON,
MISS MARGARET H. TRACY, *Secretary*.

CHANGES IN THE STAFF OF THE MILTON HOSPITAL

Dr. Carleton A. Rowe of East Milton has been appointed chief of the staff of the Milton Hospital to succeed Dr. M. Vassar Pierce who has held this position since the hospital started. Dr. Pierce will be chief medical consultant. Dr. Rowe is a graduate of Tufts College Medical School. Dr. Arthur H. Davison will serve as secretary of the staff and Dr. Walter C. Kite will succeed Dr. Pierce as a member of the executive committee of the staff.

APPOINTMENT OF DR. W. B. KEELER AS HEALTH COMMISSIONER OF BOSTON

His Honor Mayor Mansfield has appointed Dr. William Basil Keeler to the position of Health Commissioner of Boston to fill the vacancy caused by the death of Dr. Mahoney.

Dr. Keeler graduated from Tufts College Medical School in 1903, after a preliminary education acquired in the English High School of Boston, and has served under Dr. Mahoney as assistant to Dr. Charles F. Wilinsky, Deputy Commissioner of Health, with the assignment as medical inspector for the South Boston Health Unit, one of the groups created under the White Fund.

The position carries with it great opportunities for service and Dr. Keeler may be sure of the cordial coöperation of the medical profession.

APPOINTMENTS UNDER THE SOCIAL SECURITIES ACT

Six Massachusetts physicians will act on the general advisory committee on maternal and child welfare service: Kenneth D. Blackfan, M.D., professor of pediatrics, Harvard University Medical School; Robert B. Osgood, M.D., emeritus professor of orthopedic surgery, Harvard University Medical School; Douglas A. Thom, M.D., director, division of mental hygiene, State Department of Mental Diseases, Boston; Robert L. DeNormandie, M.D., instructor in obstetrics, Harvard University Medical School; Bronson Crothers, M.D., Harvard University Medical School, and T. Duckett Jones, M.D., research director, House of Good Samaritan, and instructor in medicine, Harvard.

APPOINTMENT OF DR. LOUIS C. KRESS

Dr. Louis C. Kress, director of the New York State Division of Cancer Control, has been appointed chairman of the state cancer committee of the American Society for the Control of Cancer, succeeding Dr. Burton T. Simpson.—*Science.*

RESIGNATION OF DR. WILLIAM HALLOCK PARK

Dr. William Hallock Park retired on his seventy-second birthday anniversary on December 30 from active work as director of the Bureau of Laboratories of the New York Department of Health. He will take a six months' vacation, after which he will retire permanently as director and become director emeritus. He has held the post for forty-one years. The new William H. Park Research Laboratories, named in his honor, will have been completed, so that they can be dedicated while Dr. Park is still nominally in the city's service. He expects to continue to work at the laboratories in an advisory capacity. Dr. Ralph Muckenfuss, acting associate director, will be in charge during his absence. Next summer Dr. Park will retire from the Hermann M. Biggs professorship of preventive medicine at the New York University College of Medicine.—*Science.*

CORRESPONDENCE

AN EXPLANATION

Editor, *New England Journal of Medicine*,

Will you kindly publish in the next issue of The *Journal* this letter in order to clarify certain misunderstandings in regard to the column devoted to Obstetrics and Gynecology.

Each week there appears in The *Journal* an article on Obstetrics or Gynecology and while these are under the direction of the Section of Gynecology and Obstetrics of the Massachusetts Medical Society the articles are written by various men and not, as seems to be the general impression, written by the Officers of the Section. Some of the articles published have brought forth comments but in order that no misunderstanding may exist we wish it understood that both the title and subject matter of any paper published represent the individual viewpoint and responsibility of the writer of that article.

In the issue of The *Journal* for January 16, 1936 there appears an article on "Interruption of Pregnancy" which is a highly controversial subject and the views therein expressed have caused considerable comment.

As Chairman of the Section I wish to state without qualification, that the Section does not advocate or endorse the use of abortion as a therapeutic measure. The statements made in the article referred to are the opinions of the writer of the article from his experience and according to his judgment.

May I also say, in order that my personal opinion may be on record, that I do not now and never have believed in the termination of pregnancy before the age of viability.

CHARLES J. KICKHAM, M.D., *Chairman*,
Section of Gynecology and Obstetrics,
Massachusetts Medical Society.

PHYSICIANS' GROUP IN THE COMMUNITY FUND CAMPAIGN

January 24, 1936.

Editor, *New England Journal of Medicine*,

Due to certain inaccuracies appearing in the January 16 number of The *New England Journal of Medicine* regarding the personnel of the Physicians' Group in the Community Fund Campaign I give below a correct list of the organization of this group:

Vice Chairmen: Dr. James A. Halsted, Dr. George C. Shattuck.

Lieutenants: Dr. Theodore Badger, Dr. Myles Baker, Dr. Laurence Ellis, Dr. Henry Faxon, Dr. Trygve Gundersen, Dr. Charles C. Lund, Dr. Francis Rackemann, Dr. William M. Shedden, Dr. Richard Stetson, Dr. Augustus Thorndike, Jr., and as solicitors some seventy other doctors.

JOHN P. MONKS, M.D., *Group Chairman*.

TYPING SERVICE AT THE FAULKNER HOSPITAL

January 21, 1936.

Editor, *New England Journal of Medicine*,

In your issue of January 16 on page 131 under correspondence, there is a letter by the Commissioner of Public Health of the Commonwealth in regard to the abuse of diagnostic service. In the first paragraph he calls attention to the fact that the Department of Public Health through its diagnostic laboratory offers an opportunity for typing of sputum at any hour of the day and adds that in this respect it is offering a service that is not available even in the hospitals of the State. I do not know about other hospitals in the State, but I would like to call attention to the fact that The Faulkner Hospital, which is a community hospital for the patients of physicians who are on the Executive or Associate Staff, offers service for typing sputum from pneumonia patients throughout the twenty-four hours of the day.

C. FROTHINGHAM, M.D.

1153 Centre Street,
Jamaica Plain, Mass.

UNITED STATES DEPARTMENT OF AGRICULTURE

Extension Service

January 17, 1936.

Medical Society of the State of Massachusetts,

We are now arranging our annual conference for Extension Service workers in the twelve Eastern States which will be held in Boston, at the Hotel Statler, February 19, 20 and 21, 1936. The extension specialists in Clothing will be one of the groups attending this conference.

You are doubtless familiar with the broad scope of the Home Economics Extension Program carried on with rural women. The clothing work which is one phase of the homemaking program aims to help farm families dress suitably, becomingly and economically. Through this Service, farm women and girls learn to make and remodel garments as well as study selection of materials and ready-made clothes. In connection with this project, our extension workers are constantly asked for information and advice on the following matters:

1. Selection and fitting of shoes.
2. Types of foundation garments.
3. Scientific care of complexion and hair.

At the February Conference, it is our desire to bring our specialists some help along these lines and we wish to ask for your suggestions as to available speakers who would present these matters from a scientific angle. We will appreciate it if you will refer us to physicians or other qualified speakers who could appear on our program.

Some members of your association may have written articles on these topics. If so, we would be glad to have the references.

FLORENCE L. HALL,
Extension Home Economist.

Washington, D. C.

THE CAMPAIGN AGAINST PNEUMONIA

The Commonwealth of Massachusetts
Department of Public Health
State House, Boston

January 24, 1936.

Editor, *New England Journal of Medicine*,

Thank you for your interesting letters of the twenty-first. You ask if we can send you material on the work done in Massachusetts on pneumonia. Let me say that we are in the process now of drawing up the final report of that work. This should be available within a couple of weeks. I doubt very much whether any considerable part of the report will ever be published, but there are some things which I think it would be very wise to get into the literature, but we would have to decide that later when we have all our facts and figures together.

It is very gratifying to have you interested in this pneumonia work. You ask if in our opinion the figures you sent in one of your letters were approximately correct. This is difficult to answer in an offhand manner because an examination of those figures shows clearly that the estimation of the number of lives that may be saved by the early use of serum depends largely on what death rate a person is willing to accept as the usual death rate in serum treated cases. I have recomputed these figures, as you will see below, and my totals are somewhat different from the ones given in your letter. I do not know on what your figures are based, but my com-

putation is based on a careful review of the literature to determine the usual death rate of Type I and II cases not given serum, and the death rate of cases of those two types treated during the past five years in this State with serum. The death rate in Type I cases without serum is 25 per cent, and in our series with serum in the first four days of illness is 11 per cent. Thus the use of serum allowed a reduction in the usual death rate of about 56 per cent. In Type II cases without serum the death rate is 41 per cent, and in our series with serum is 27 per cent, allowing a reduction of 34 per cent in the death rate.

You state your figures are based on the U. S. Public Health Reports for 1934. I do not have those at hand, but I have some that I did some time ago. These are tabulations of the death statistics from the U. S. Registration Area for the ten years of 1920-1929 inclusive. There were 1,006,869 deaths from pneumonia of all forms in the area in that period. Of these, 583,759 were caused by lobar and undefined pneumonia, and 423,110 by bronchopneumonia and capillary bronchitis. For ordinary purposes of computation, the first group is considered simply as lobar pneumonia and the second group simply as bronchopneumonia. Estimating the usual death rate of lobar pneumonia at 25 per cent, there were four cases for each death. This would give annually 237,504 cases of lobar pneumonia. We have done the same thing for bronchopneumonia and estimated that there are 169,244 cases yearly. This latter figure may be too high, however, because nobody really knows what the usual death rate in bronchopneumonia is likely to be. In any event, to proceed, we have found in a collected series of typed lobar pneumonia cases in the literature that in over 3,000 cases, pneumococci caused about 95 per cent of the cases. If we apply this 95 per cent figure to the total number of lobar pneumonia cases estimated to occur in this country each year, we find that there were 225,628 cases of pneumococcus lobar pneumonia yearly. In bronchopneumonia, however, only about half the cases are due to pneumococci; thus there would be 84,622 broncho cases each year.

The totals of these figures, then, would show that there are in the United States each year approximately 310,250 cases of pneumococcus pneumonia.

In a series of nearly 10,000 typed cases of lobar pneumonia we have collected from the literature, Type I was responsible for 33.4 per cent, and Type II for 23.3 per cent of the cases. If these percentages are applied to the total pneumococcus lobar pneumonia cases estimated to occur here each year, we find that there are 127,932 cases of Type I or II pneumococcus lobar pneumonia annually. In bronchopneumonia our figures for type incidence rest on much less secure ground and are based on around 400 cases which have been typed. This series showed that Type I caused 2 per cent and Type II, 3 per cent of the cases. Applying these percentages to the pneumococcus bronchopneumonia cases, we find that these together total about 4,231 cases annually.

The totals for the Type I and II pneumococcus pneumonia cases, both lobar and broncho, show that there are annually about 132,162 cases occurring in this country.

To condense all this and make it comparable to the figures you sent me, let me say that each year in the United States there are 310,250 cases of pneumococcus pneumonia, of which 132,162 are Types I or II:

Type	No. Cases	Probable Deaths Without Serum	Probable Deaths With Serum	Lives Savable
I	77,052	19,263	8,476	10,787
II	55,110	22,595	14,880	7,715
Totals	132,162	41,858	23,356	18,502

I think these figures are as accurate as can be computed at the present time. It should be appreciated, however, that they represent estimates and nothing more. I hope this information will be of some value to you.

RODERICK HEFFRON, M.D.

RECENT DEATHS

ROBERTSON—JAMES DOUGLAS ROBERTSON, M.D., of 1 Auburn Court, Brookline, Massachusetts, died at his home January 25, 1936. He was born in Perth, Scotland, in 1863 and graduated from the College of Physicians and Surgeons, Boston, in 1894.

He was active in the Masonic order and several fraternal societies.

PACKARD—HORACE PACKARD, M.D., a retired surgeon of Stoughton and 470 Commonwealth Avenue, Boston, died January 24, 1936, in Stoughton, Massachusetts. Dr. Packard was born at Bridgewater, Massachusetts in 1855 and graduated from the Boston University School of Medicine in 1880. He subsequently studied in Berlin, Prague, Paris, London and Vienna.

He was consulting surgeon at the Massachusetts Homeopathic, the Newton and Brockton Hospitals. He was for many years professor of surgery at the Boston University School of Medicine.

Dr. Packard joined the Massachusetts Medical Society in 1907 and retired in 1925. He was a member of the American Institute of Homeopathy, the American Medical Association, the Massachusetts Homeopathic Medical Society and the Massachusetts Surgical and Gynecological Society. He was also a member of the Boston City Club, the Twentieth Century Club and the University Club.

CLARK—WILLIAM L. CLARK, M.D., of Philadelphia, well known throughout the country as a pioneer in the use of electricity in surgery, died January 12, 1936.

He visited Boston on several occasions to address various medical groups and made many friends in this locality. Prior to June 1935, he was for three years President of the Academy of Physical Medicine. He was an Honorary Fellow of the New England Physical Therapy Society, a Fellow of the American Medical Association, American College of Radiology, American Radium Society, and was actively identified with several other medical and surgical groups.

His widow, Mrs. Mary Clark, four sons and two daughters survive him. A sister, Mrs. Sydney Cornell, resides in Newton.

NOTICES

ANNOUNCEMENT REGARDING APPOINTMENT OF SENIOR MEDICAL INTERNES BY THE UNITED STATES PUBLIC HEALTH SERVICE

The United States Public Health Service will consider applications to fill a number of vacancies which exist at the present time and also vacancies which will occur about July first next, for second-year medical internes. Any young physicians, not over thirty years of age, who have graduated from a Class "A" medical college and who have completed, or will shortly complete, one year's internship in an approved hospital are eligible to apply.

The Public Health Service desires to secure applications only from candidates who are interested in the Service as a career and who desire to request permission to appear before a board of commissioned officers for examination for appointment as Assistant Surgeons in the regular commissioned corps, on or about the time they will complete a year's service as internes in the Public Health Service.

Those interested in making application should address an inquiry to the Surgeon General, U. S. Public Health Service, Washington, D. C., stating the date they will be available for duty and more complete information and the necessary blanks upon which to make application will be furnished.

POSTGRADUATE INSTITUTE IN PHILADELPHIA*

A Postgraduate Institute, offering an intensive and interesting study of the newer work in the field of cardiovascular and renal diseases, will be conducted by the Philadelphia County Medical Society during the week of April 20 to 24, inclusive.

The program, to be held in the Bellevue-Stratford Hotel, Philadelphia, has been designed to meet the needs of all members of the profession, but particularly those in general practice. Physicians from all parts of the eastern and east-central United States are invited to attend.

Lecturers, about thirty in number, have been selected from among the foremost teachers in this great center of medical education. The medical faculties of the University of Pennsylvania, Jefferson, Temple, and the Woman's Medical College of Pennsylvania are represented on the program. While approaching the subject from specialized viewpoints—those of the physiologist, cardiologist, pediatrician, surgeon, roentgenologist, bacteriologist, internist—the presentations will be of a strictly practical nature, and should be of real value to the general physician, who finds cardiorenal conditions occupying a large proportion of his time.

The Philadelphia County Medical Society, in conducting the Postgraduate Institute, is meeting the demands of many physicians, who have felt that the organized profession should provide them with this type of opportunity for keeping abreast of medical progress and thus maintain the highest standards of medical service. The only charge is a $5.00 registration fee to cover the Institute's expenses. It is hoped to make the event an annual one, giving special attention each year to a different subject.

*See Advertising Section, page ix.

MEDICAL CLINIC AND STAFF ROUNDS AT THE PETER BENT BRIGHAM HOSPITAL

At 3:30 P.M. on Thursday, February 6, in the Amphitheatre of the Peter Bent Brigham Hospital, Dr. E. Stanley Emery, Jr., will give a medical clinic. To it are cordially invited practitioners and medical students.

On Saturdays in the wards of the Peter Bent Brigham Hospital, from 10 to 12, staff rounds will be conducted by Dr. Christian.

A CORRECTION

The Baker Memorial Clinic of the New England Deaconess Hospital was referred to in a footnote appearing on page 45 of our issue of January 9. It has been brought to our attention that the footnote should have read "From the Lahey Clinic, the George F. Baker Clinic of the New England Deaconess Hospital and the New England Baptist Hospital."

FUNCTIONAL ASPECTS OF BASES OF BEHAVIOR

This is a course which gives wide information and important insight into phases of education both outside and inside the school's educational program. It makes such practical application of certain principles of mental hygiene that it offers direct and specific suggestion to those who would put these principles into practice. For information as to the names of lecturers apply to Boston University School of Education, 29 Exeter Street, Boston.

BOSTON DISPENSARY

25 Bennet Street, Boston

MEDICAL CONFERENCE PROGRAM

9-10 A.M., February, 1936

Saturday, February 1—Presentation of Ward Case. Dr. P. A. F. Hoefer.

Tuesday, February 4—Shoulder Conditions. Dr. John D. Adams.

Wednesday, February 5—"Indications for Various Methods for the Relief of Prostatic Obstruction." Dr. Harold A. Chamberlin.

Thursday, February 6—Endocrine Clinic. Dr. Charles Lawrence.

Friday, February 7—"Objective Studies in Angina Pectoris." Dr. Joseph Riseman.

Saturday, February 8—Presentation of Ward Case. Dr. Jacob Schloss.

Tuesday, February 11—"Recognition of the Early Psychoses; Their Differentiation from Neuroses." Dr. A. Warren Stearns.

Wednesday, February 12—"Mistakes Made in the Diagnosis and Treatment of Syphilis."—Dr. Francis Thurmon.

Thursday, February 13—Social Service Case Presentation. Miss Edith Canterbury.

Friday, February 14—"Pituitarytropic Studies." Dr. Saul Hertz.

Saturday, February 15—Presentation of Ward Case. Dr. H. C. Gordinier.

Tuesday, February 18—X-Ray Demonstration. Dr. Alice Ettinger.

Wednesday, February 19—"Auscultation of the Abdomen." Dr. Neil Stevens.

Thursday, February 20—Heart Clinic. Dr. Samuel H. Proger.

Friday, February 21—"Some Aspects of Clinical Endocrinology." (With Motion Pictures.) Dr. Lewis M. Hurxthal.

Saturday, February 22—Holiday.

Tuesday, February 25—Case Presentation. Dr. Francis Mc Donald.

Wednesday, February 26—"The Present Rôle of the General Surgeon in a Modern Hospital." Dr. Hilbert F. Day.

Thursday, February 27—Diabetic Clinic. Dr. Jacob Schloss.

Friday, February 28—Physiological Adventures Abroad. Dr. G. Philip Grabfield.

Saturday, February 29—Presentation of Ward Case. Dr. H. Magendantz.

NOTICES OF MEETINGS

HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held in the Peter Bent Brigham Hospital Amphitheatre (Shattuck Street Entrance), Tuesday evening, February 11, at 8:15 P.M.

PROGRAM

Presentation of Cases.

The Effect of Hypophysectomy and Adrenalectomy upon Experimental Diabetes in the Cat. By Dr. C. N. H. Long, University of Pennsylvania, Philadelphia, Pennsylvania.

Medical students and physicians are cordially invited to attend.

MARSHALL N. FULTON, M.D., *Secretary.*

GREATER BOSTON MEDICAL SOCIETY

The next meeting of the Greater Boston Medical Society will be held on Tuesday, February 4, at 8:00 P.M. in the Auditorium of the Beth Israel Hospital, Boston.

PROGRAM

Speaker: Richard Lewisohn, M.D., Visiting Surgeon, Mt. Sinai Hospital, New York City.

Subject: Recent Advances in the Surgical Treatment of Chronic Duodenal Ulcer.

Discussion by Frank H. Lahey, M.D.; Arthur W. Allen, M.D., and Charles G. Mixter, M.D.

H. LINENTHAL, M.D., *President,*
D. B. STEARNS, M.D., *Secretary.*

GREATER BOSTON BIKUR CHOLIM HOSPITAL

The Greater Boston Bikur Cholim Hospital medical meeting will be held Wednesday evening, February 5, at 8:30 o'clock, at the Nurses' Home, 45 Townsend Street, Roxbury. Speaker: Dr. Abraham Myerson. Subject: Neuroses. The profession is invited.

HENRY BAKER, M.D., *Secretary.*

FAULKNER HOSPITAL CLINICAL MEETING

The next clinical meeting will be held at The Faulkner Hospital on Thursday, February 6, 1936, at 5:00 P.M. In addition to the usual clinical pathological conference Dr. Harry C. Solomon will talk on "The Application of Fever Therapy in Several Diseased Conditions."

All physicians are invited.

NEW ENGLAND HEART ASSOCIATION

The next meeting of the New England Heart Association will be held at the Beth Israel Hospital, Boston, Mass., Monday, February 3, 1936, at 8:15 P.M.

PROGRAM

1. A Case of Coronary Occlusion with Interesting Features. Dr. Harry B. Levine.
2. Evaluation of Medicinal Treatment of Angina Pectoris. Dr. Joseph E. F. Riseman.
   Studies on the Effect of Nitroglycerin on Angina Pectoris. Dr. Morton G. Brown.
3. Incidence of Coronary Heart Disease and Hypertensive Heart Disease in Different Population Groups. Dr. Louis Silver.
4. The Cardiac Output in Patients with Congestive Failure after Total Thyroidectomy. Dr. Mark D. Altschule.
5. A Clinical and Pathologic Study of Aortic Stenosis. Dr. Louis Wolff and Dr. Monroe Schlesinger.
6. A Summary of Clinical Experience in the Treatment of Chronic Heart Disease by Total Thyroidectomy. Dr. Herrman L. Blumgart.

All members of the New England Heart Association and interested physicians are invited to attend.

JAMES M. FAULKNER, M.D., *Secretary.*

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, FEBRUARY 3, 1936

Monday, February 3—

*8:15 P.M. New England Heart Association. Beth Israel Hospital, Boston.

Tuesday, February 4—

*9-10 A.M. Boston Dispensary, 25 Bennet Street, Boston. Shoulder Conditions. Dr. John D. Adams.

2:30 P.M. Pediatric Ward Visit. Massachusetts Eye and Ear Infirmary.

8 P.M. Greater Boston Medical Society. Beth Israel Hospital, Boston.

Wednesday, February 5—

*9-10 A.M. Boston Dispensary, 25 Bennet Street, Boston. "Indications for Various Methods for the Relief of Prostatic Obstruction." Dr. Harold A. Chamberlin.

†12 M. Clinico-Pathological Conference. Children's Hospital.

*8:30 P.M. Greater Boston Bikur Cholim Hospital Medical Meeting. 45 Townsend Street, Roxbury.

Thursday, February 6—

*8:30-9:30 A.M. Clinic, Surgical Staff of the Peter Bent Brigham Hospital, at the Peter Bent Brigham Hospital.

*9-10 A.M. Boston Dispensary, 25 Bennet Street, Boston. Endocrine Clinic. Dr. Charles Lawrence.

*3:30 P.M. Medical Clinic at the Peter Bent Brigham Hospital.

*5 P.M. Faulkner Hospital Clinical Meeting at the Faulkner Hospital.

Friday, February 7—

*9-10 A.M. Boston Dispensary, 25 Bennet Street, Boston. "Objective Studies in Angina Pectoris." Dr. Joseph Riseman.

Saturday, February 8—

*9-10 A.M. Boston Dispensary, 25 Bennet Street, Boston. Presentation of Ward Case. Dr. Jacob Schloss.

*10-12. Staff rounds at the Peter Bent Brigham Hospital.

Sunday, February 9—

4 P.M. Free Public Lecture, Harvard Medical School, Building D, Longwood Avenue. Gout and Allied Conditions. Dr. F. C. Hall.

*Open to the medical profession.
†Open to Fellows of the Massachusetts Medical Society.

February 1-29—Boston Dispensary, Medical Conference Program. See page 224.

February 3—New England Heart Association. See page 225.

February 4—Greater Boston Medical Society. See page 225.

February 5—Greater Boston Bikur Cholim Hospital. See page 225.

February 6—Medical Clinic, Peter Bent Brigham Hospital. See page 224.

February 6—Faulkner Hospital Clinical Meeting. See page 225.

February 11—Harvard Medical Society. See page 225.

February 14—William Harvey Society, 8 P.M. Beth Israel Hospital, Boston.

February 24—Springfield Medical Association, 8:30 P.M. at the rooms of the Springfield Academy of Medicine, 20 Maple Street.

February 24 to May 16—International Medical Postgraduate Courses in Berlin. See page 1211, issue of December 12, 1935.

March 2-6—The American College of Physicians. See page 91, issue of January 9.

April 20-24—A Postgraduate Institute in Philadelphia. See page 224.

June 15-19—The Executive Board of the Catholic Hospital Association will meet at the Fifth Regiment Armory, Baltimore, Md.

September, 1936—First International Conference on Fever Therapy. See page 1325, issue of December 26, 1935.

October 19-23—Clinical Congress of the American College of Surgeons. See page 180, issue of January 23.

DISTRICT MEDICAL SOCIETIES

ESSEX SOUTH DISTRICT MEDICAL SOCIETY

February 5—Council Meeting, Boston.

February 12—Wednesday. Addison Gilbert Hospital, Gloucester. Clinic 5 P.M. Dinner 7 P.M. Speaker and subject to be announced later.

March 4—Wednesday. Lynn Hospital. Clinic 5 P.M. Dinner 7 P.M. Speaker: Dr. Timothy Leary. Subject: Arteriosclerosis.

April 1—Wednesday. Essex Sanatorium, Middleton. Clinic 5 P.M. Dinner 7 P.M. Speaker: Dr. Richard H. Overholt of the Lahey Clinic. Subject: Chest Surgery.

May 7—Thursday. Censors' Meeting.

May 13—Wednesday. Annual Meeting. Salem Country Club. Dinner at 7 P.M. Speaker: Dr. Paul White. Subject to be announced later.

R. E. STONE, M.D., Secretary.
88 Lothrop Boulevard, Beverly.

FRANKLIN DISTRICT MEDICAL SOCIETY

Meetings are held on the second Tuesday of March and May at the Weldon Hotel, Greenfield, at 11 A.M.

CHARLES MOLINE, M.D., Secretary.
Sunderland.

MIDDLESEX EAST DISTRICT MEDICAL SOCIETY

Meetings to be held at the Bear Hill Golf Club, Stoneham, at 12:15 P.M.

March 11, May 6.

K. L. MACLACHLAN, M.D., Secretary.
1 Bellevue Avenue, Melrose.

NORFOLK DISTRICT MEDICAL SOCIETY

February 25—Massachusetts Memorial Hospitals at 8 P.M. Papers by the staff.

March 31—Hotel Kenmore, at 8 P.M. Dr. Benedict F. Boland—"Cauterization of the Cervix Uteri Using Various Electrical Methods." Illustrated with lantern slides.

May—Annual Meeting. (Place, date and subject to be announced.)

The censors meet for the examination of candidates: May 7, 1936; November 5, 1936.

FRANK S. CRUICKSHANK, M.D., Secretary.
1236 Beacon Street, Brookline.

PLYMOUTH DISTRICT MEDICAL SOCIETY

March 19—Plymouth County Sanatorium, South Hanson.

April 16—Brockton Hospital.

May 21—Lakeville State Sanatorium.

G. A. MOORE, M.D., Secretary.
167 Newbury Street, Brockton.

SUFFOLK DISTRICT MEDICAL SOCIETY

March 18—Meeting at the Boston Medical Library. "The Laboratory and Clinical Story of Fatigue," Dr. Arlie V. Bock and Dr. David B. Dill. Discussion: Dr. Donald J. MacPherson and Dr. Augustus Thorndike, Jr.

April 29—Annual Meeting at the Boston Medical Library. "The Treatment of Septicaemia," Dr. Champ Lyons. "The Plurality of Scarlatinal Streptococcus Toxin," Dr. Sanford B. Hooker. Discussion: Dr. Hans Zinsser.

The medical profession is cordially invited to attend all of these meetings.

ROBERT L. DeNORMANDIE, M.D., President,
CHARLES C. LUND, M.D., Secretary.

WORCESTER DISTRICT MEDICAL SOCIETY

February 12—Wednesday evening. Worcester State Hospital, Worcester, Mass. Dinner and scientific program. Subjects of program to be announced later.

March 11—Wednesday evening. Memorial Hospital, Worcester, Mass. Dinner and scientific program. Subjects of program to be announced later.

April 8—Wednesday evening. Hahnemann Hospital, Worcester, Mass. Dinner and scientific program. Subjects of program to be announced later.

May 13—Wednesday afternoon and evening. Annual Meeting of Society. Time, place and details of program to be announced in an April issue of the Journal.

ERWIN C. MILLER, M.D., Secretary.
27 Elm Street, Worcester.